Technology Review

Edited at the Massachusetts Institute of Technology

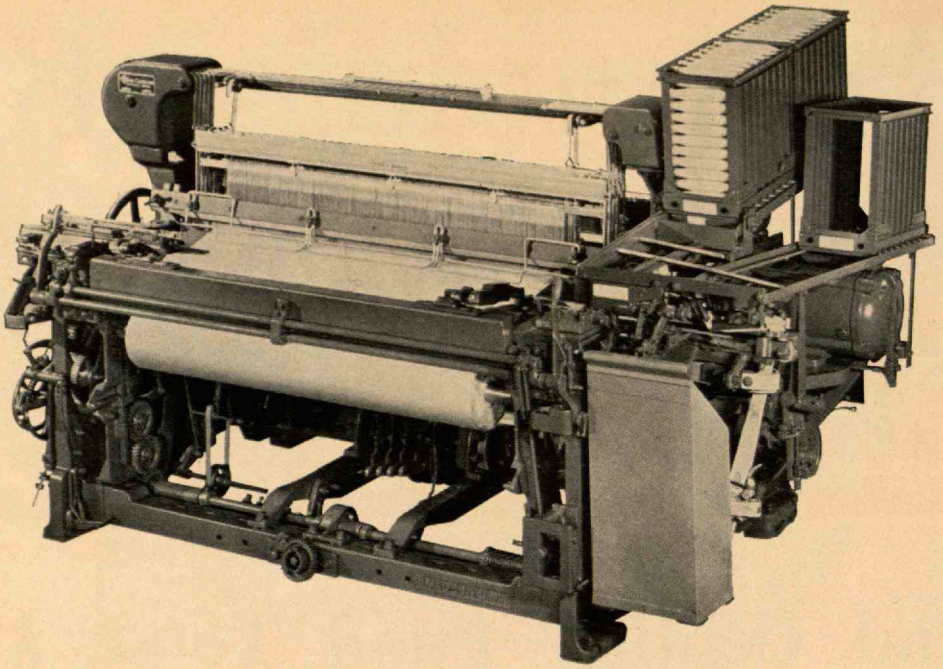
June, 1963

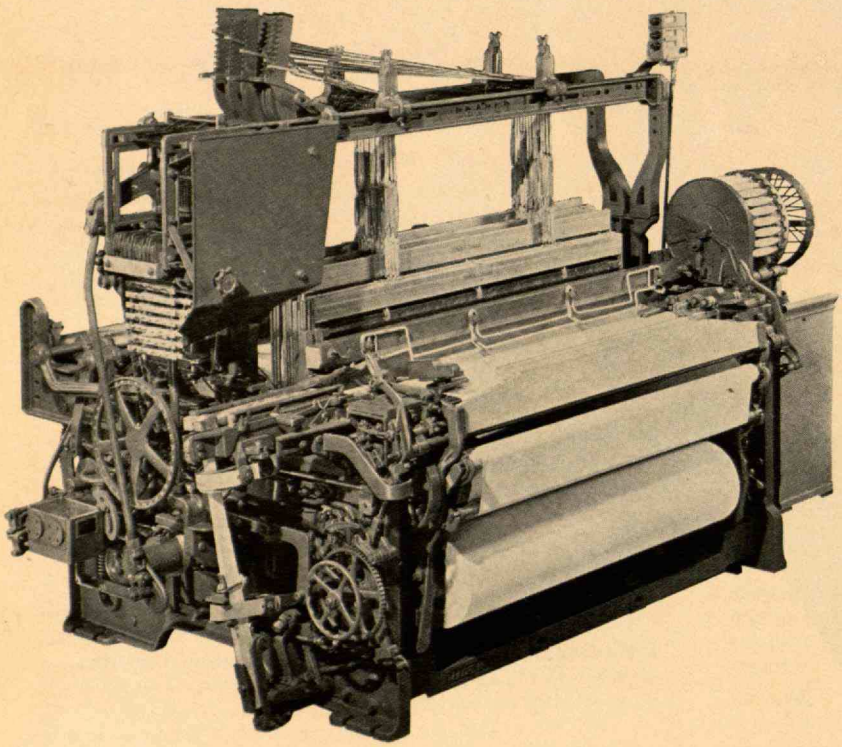
2nd Century Fund Total: $98,000,000

Page 17

Visitors at M.I.T., Page 37

technology
review
Published by MIT





DRAPER CORPORATION

Engineers and manufacturers for the world's most accepted high-speed, automatic looms.

HOPEDALE, MASS. • ATLANTA, GA. • GREENSBORO, N. C. • SPARTANBURG, S. C.

Shell's first FULLY-INTEGRATED wax facility

PROJECT:
Wax Plant at Stanlow, England

CLIENT:
Shell Refining Company Limited

ENGINEERS:
Stone & Webster Engineering Limited

To meet the increased European demand for paraffin wax—a high value petroleum by-product—Stone & Webster, in cooperation with the Shell Group Design Staff, designed and constructed a large wax plant at Stanlow, England for Shell Refining Company Limited. The plant's hydrotreating unit is the first of its kind to be put into full-scale operation. In addition, the fully-integrated wax facility includes a vacuum distillation unit, a wax crystallization and solvent recovery system, and an automated molding and packaging operation.

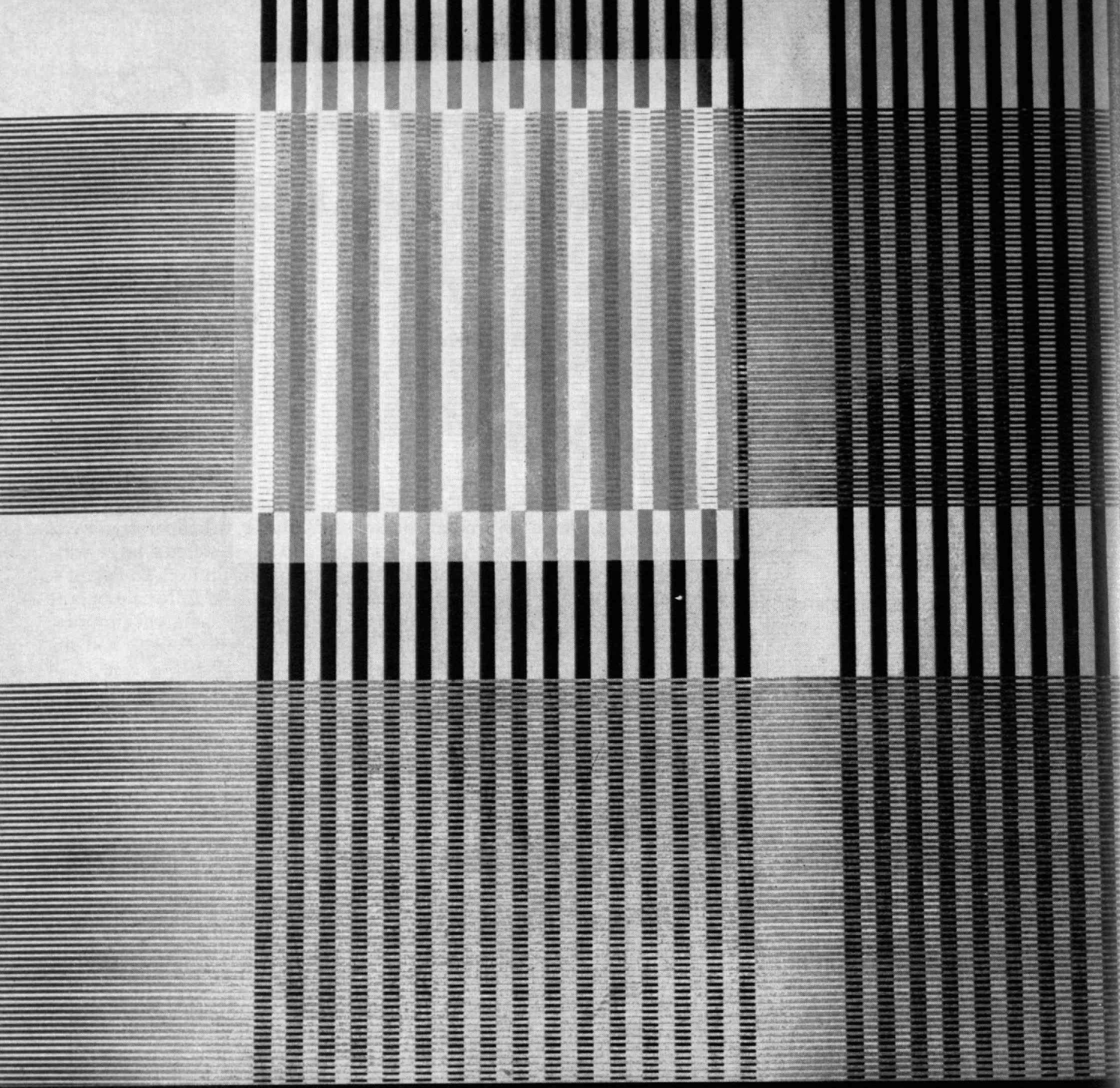
Stone & Webster designs and constructs power stations, petroleum and chemical plants, pulp and paper mills and many other types of industrial plants throughout the world. We would welcome an opportunity to serve you.

STONE & WEBSTER Engineering Corporation

New York · Boston · Chicago · Houston · San Francisco · Los Angeles · Seattle · Washington, D. C.

Stone & Webster Engineering Limited-London • Stone & Webster Engineering S. A.-Paris • Stone & Webster Engineering N.V.-Amsterdam

Stone & Webster Canada Limited-Toronto • Associated Nucleonics, Inc.-Garden City, N. Y.



Thin Film Memory Unit

Lincoln Laboratory, a research center of the Massachusetts Institute of Technology, conducts investigations in selected areas of advanced electronics, with emphasis on applications to national defense and space exploration. The *Information Processing research program* is directed toward enriching the technology of digital computers, developing improved techniques for automatic data processing systems, and increasing understanding of the interaction between computers and their users. All qualified applicants will receive consideration for employment without regard to race, creed, color or national origin. Lincoln Laboratory, M.I.T., Box 28, Lexington 73, Massachusetts.

Solid State Physics
Information Processing
Radio Physics and Astronomy
Radar Design
Control Systems
Space Surveillance Techniques
Re-entry Physics
Space Communications

A description of the Laboratory's work will be sent upon request.

Edited at the Massachusetts Institute of Technology
Volume 65, Number 8

Technology Review

FREDERICK R. KAPPEL addressed the Second Century Fund's Victory Dinner in New York (see pages 17 through 23) from a head table at which scores of the nation's most eminent businessmen and educational leaders were seated. It marked, said The New York Herald-Tribune, *"the completion of the largest successful campaign for private donations ever undertaken by an American college or university."*

TECHNOLOGY REVIEW is published monthly from November to July inclusive, on the 27th day of the month preceding the date of issue, by the Alumni Association of the Massachusetts Institute of Technology. All correspondence regarding its editorial contents, subscriptions, advertising, and changes of address should be addressed to:

Room 1-281, M.I.T.,
Cambridge 39, Mass.

The Review's publisher and editor is *Volta Torrey;* business manager, *R. T. Jope, '28;* assistant to the editor, *Ruth King;* and class news editor, *Roberta A. Clark.* Editorial consultants are *J. J. Rowlands, Francis E. Wylie,* and *John I. Mattill.* Members of its staff are *Madeline R. McCormick, Patricia Fletcher,* and *Maxine Kenny.*

Officers of the Alumni Association of M.I.T. are: *William L. Taggart, Jr., '27,* President; *Donald P. Severance, '38,* Executive Vice-president; *Carroll L. Wilson, '32,* and *F. Leroy Foster, '25,* Vice-presidents; and *Frederick G. Lehmann, '51,* Secretary.

An annual subscription to Technology Review is $4 in the U.S., $4.50 in Canada and elsewhere, and a single copy, 60 cents. Three weeks must be allowed to effect a change of address, for which both the old and the new address of the subscriber should be given.

The office of publication is 10 Ferry St., Concord, N.H., where the Review is printed by The Rumford Press. Second-class postage is paid at Concord, N.H.

POSTMASTER: Please return undeliverable copies to The Rumford Press, 10 Ferry St., Concord, N.H.

Contents

June, 1963

This issue of The Review is devoted largely to the news that:

Features

Departments

The cover was designed by Mrs. Marion Poverman. George Woodruff took the photos and those on page 37; Martha Holmes, the picture on page 18; Lincoln Laboratory staffmen those on pages 29 and 30; and Bob Lyon most of the others in this issue.

Individuals Noteworthy

New Alumni Officers

THE presidential gavel of the M.I.T. Alumni Association will be taken up on Alumni Day, June 10, by *Robert H. Winters, '33*. Elected with him in the balloting that ended April 25 were *Samuel A. Groves, '34,* Vice-president, and *Gregory Smith, '30,* and *Ralph H. Davis, '31,* Executive Committeemen.

The Association's nominees for term membership on the M.I.T. Corporation are: *William L. Taggart, Jr., '27, Elisha Gray, '28,* and *Thomas F. Morrow, '35,* for five-year terms; and *Ivan A. Getting, '33,* for a one-year term.

To fill three vacancies on the National Nominating Committee, the Alumni chose *Samuel R. Spiker, '25, Arthur W. Davenport, '23,* and *Edgar F. Seifert, '19.*

Honors to Alumni

MANSON BENEDICT, '32, of the M.I.T. Faculty received the American Chemical Society Award in Industrial and Engineering Chemistry, sponsored by the Esso Research and Engineering Company, and was also one of the prominent scientists chosen to accompany Chairman Glenn T. Seaborg of the Atomic Energy Commission on a visit to the Soviet Union.

Other recent recipients of honors have included *William K. Cave, '27,* the U. S. Army's Exceptional Civilian Service Award; and Lieutenant Colonel *E. Robert de Luccia, '27,* and Colonel *Charles C. Noble, '48,* respectively, the George W. Goethals and Wheeler Medals by The Society of American Military Engineers.

Architect Honored

A COMMEMORATIVE STAMP issued recently by the federal government of Australia honored an American for the first time and an architect for the first time. It bore the likeness of the late Walter Burley Griffin, whose wife was Marion Mahoney, '94. Mr. Griffin was widely

known as the planner of Canberra, and was assisted in many ways by his wife, who was famous for having been Frank Lloyd Wright's prize delineator.

Mrs. Victor H. Mattfeld

Associate Dean

JACQUELYN ANDERSON MATTFELD has been appointed associate dean of student affairs at M.I.T. to work with the Institute's 220 women students. She is the wife of Victor H. Mattfeld, Assistant Professor of Music, and has been associate dean of instruction and dean of East House at Radcliffe College and lecturer in the Music Department at Harvard.

Mrs. Mattfeld received her B.A. from Goucher College, studied music at the Peabody Conservatory of Music, and earned a doctorate in music history at Yale in 1959. She has taught music in Maryland, Connecticut, New Jersey and New York, and set up the music curriculum for the Preparatory Department at the New England Conservatory of Music. At Radcliffe she has been concerned with admissions, financial aid, and student activities, and responsible for the well-being of students living in six dormitories.

The Mattfelds have two daughters, Stefanie, 10, and Felicity, 8.

Graduate School Officer

ROBERT K. WEATHERALL, Associate Director of Admissions, became executive officer of the Graduate School at M.I.T. on May 1. He has B.A. and M.A. degrees from Cambridge University and served in its administration before coming to M.I.T. in 1956 as Assistant to the Dean of Students.

(Continued on page 6)

Eugene R. Black to Speak at Commencement

AT M.I.T.'s 97th commencement exercises in the Rockwell Cage the morning of June 7, the speaker will be Eugene R. Black, one of the country's foremost authorities on international financial problems.

A native of Atlanta and alumnus of the University of Georgia, he is a former vice-president of the Chase National Bank of New York and has held numerous important public posts. He is a trustee of several institutions and has received honorary degrees from Columbia, Harvard, Yale, Princeton, and other schools.

At the baccalaureate exercises for the Class of 1963, preceding commencement, Dean John E. Burchard, '23, of the School of Humanities and Social Science will speak.

Eugene R. Black

This is a gyroscope with no wheels, motors, gears, bearings, gimbals, rotors, springs or bushings.

The first magnetic induction nuclear gyroscope: a laboratory model, but functional enough to prove that the principle works. Its descendants are expected to be the most precise and dependable navigation instruments ever devised.

It has a heart of water, contained in a small glass sphere. Electrical coils around the sphere align the water's nuclear particles like bar magnets. When the gyro's orientation is changed, these particles are disturbed. They emit a faint current, which signals the change... with fanatical accuracy.

Good mechanical gyros also sense, and signal, change of direction. But as time goes on even the best of them will build up excessive drift. Since there are no moving parts in the nuclear gyro, its drift rate due to friction is zero. Because of its simple construction, it should eventually be produced at far less cost than mechanical gyros. And it will never wear out.

The one above was built under Republic's independent research and development program, and tested under Bureau of Naval Weapons sponsorship.

Tomorrow its descendants will guide men who travel on the sea... under it... in the earth's atmosphere... and beyond.

REPUBLIC
AVIATION CORPORATION
FARMINGDALE, LONG ISLAND, NEW YORK

Individuals Noteworthy

(*Continued from page 4*)

In Space Center Posts

JOHN V. HARRINGTON, '58, has been appointed professor in the Departments of Electrical Engineering and of Aeronautics and Astronautics, and director of M.I.T.'s new Center for Space Research. Lawrence E. Beckley, '42, will be administrative officer of this new center.

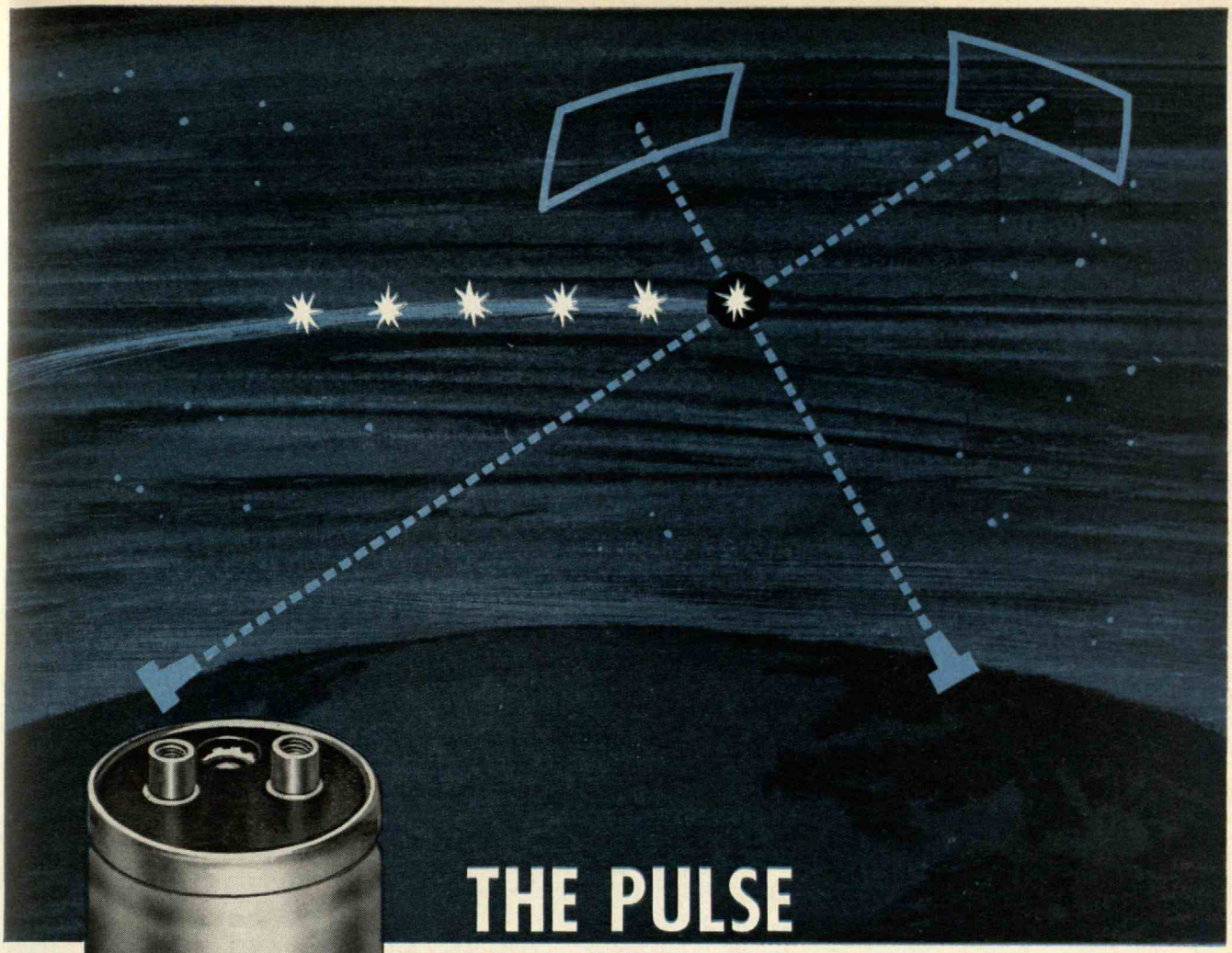
Professor Harrington has headed the Radio Physics Division at Lincoln Laboratory since 1958, and has been especially active in the study of re-entry phenomena and radar observations of the sun, moon, and nearby planets.

Born in New York, he received his B.E.E. degree from Cooper Union in 1940, the M.E.E. degree from the Polytechnic Institute of Brooklyn in 1948, and his doctorate of science from M.I.T. He was an electronics officer in the U.S. Navy, and associated with the Consolidated Edison Company of New York and the American Gas and Electric Company, before coming to Cambridge in 1946 as an electronics engineer at the Air Force Cambridge Research Center.

On assignment to M.I.T., he organized and became leader of the Data Transmission Group at Lincoln Laboratory in 1951, and later became associate head of that laboratory's Aircraft Control and Warning Division and its Communications and Components Division. He and his associates have made many contributions to automatic detection and transmission of radar signals. Professor Harrington has received the Air Force Medal for Exceptional Civilian Service and is a fellow of the Institute of Electrical and Electronics Engineers.

Mr. Beckley has been executive officer since 1960 of the Division of Aerospace Research in the Department of Aeronautics and Astronautics. Born in Pleasantville, N.J., he served as an engineering officer in the U. S. Navy during World War II, and returned to the Institute afterwards as a staff member in the Aeroelastic Laboratory. In 1952, he was made assistant director of the Division of Industrial Coöperation, and in 1956, associate director of the Instrumentation Laboratory.

(*Continued on page 10*)



THE PULSE OF ANNA

Now . . . for the first time . . . aluminum electrolytic energy-storage capacitors have been employed in an orbital satellite!

Satellite *Anna* is the world's first all-geodetic satellite. *Anna* opens the door to: more precise location of world-wide target areas; more accurate orbit planning; improvement of surface and air navigation. But perhaps the most useful aspect of *Anna* was the experience gained in developing "spaceworthy" components which can function in the difficult launch and orbital environment.

Anna's optical beacon, developed by Edgerton, Germeshausen & Grier, Inc., flashes sequential strobe signals from satellite to ranging station. *The heart of this beacon is a bank of Sprague Type 36D Powerlytic® Capacitors.* Powerlytics were chosen for their high capacitance, their compact physical size, and their ability to withstand the stringent demands of outer space.

An electrolytic capacitor specialist will be glad to discuss the application of these capacitors to *your* projects. For application engineering assistance without obligation, write to Electrolytic Capacitor Section, Field Engineering Dept. For complete technical data, write for Engineering Bulletin 3421 to Technical Literature Service, Sprague Electric Company, 255 Marshall St., North Adams, Mass.

SPRAGUE COMPONENTS

CAPACITORS
TRANSISTORS
MAGNETIC COMPONENTS
RESISTORS
MICROCIRCUITS

INTERFERENCE FILTERS
PULSE TRANSFORMERS
PIEZOELECTRIC CERAMICS
PULSE-FORMING NETWORKS
TOROIDAL INDUCTORS

HIGH TEMPERATURE MAGNET WIRE
CERAMIC-BASE PRINTED NETWORKS
PACKAGED COMPONENT ASSEMBLIES
FUNCTIONAL DIGITAL CIRCUITS
ELECTRIC WAVE FILTERS

4SC-114-63

SPRAGUE®
THE MARK OF RELIABILITY

'Sprague' and '(2)' are registered trademarks of the Sprague Electric Co.

HEAVIEST PIECE OF RAILROAD FREIGHT IN U.S. HISTORY...a reactor vessel

A new American railroading record was established recently when a huge Isocracking Reactor Column, with a gross shipping weight of 1,300,000 pounds, left the Chattanooga plant of Combustion Engineering where it was fabricated. Made of steel almost 7 inches thick, it is the heaviest single piece of freight in railroad history.

Measuring 99 feet in length and 11 feet 8 inches in diameter, it stood 18 feet above the rails as it made a 6 day, 725 mile trip to the Pascagoula Refinery of Standard Oil Co. (Kentucky). The two heavy duty, 12 axle freight cars which carried it were restricted to a maximum speed of 20 miles per hour on the trip.

Built for Fluor Corporation, Ltd., of Los Angeles, engineer-constructor of five of the major process units in the new 100,000 barrels-a-day Pascagoula Refinery, the reactor column is the largest of three fabricated by C-E for this installation. Each of the smaller units had a gross shipping weight of 1,064,000 pounds.

The Heavy Vessel Bay of C-E's Chattanooga Plant, in which the three columns were fabricated, has been specif-

Huge Isocracking Reactor Column leaves Combustion Engineering's Chattanooga plant—starting point of its 725 mile journey to the Pascagoula (Kentucky) Refinery of the Standard Oil Co.

fabricated by C-E

ically designed to handle a wide variety of difficult fabrication problems. Its specialities are products which are extremely large, heavy or thick; those made of stainless steel and other alloys; those which are intricate, require a high degree of finish and strict adherence to extremely close tolerances; and those which must be unusually clean or optically flat. All manufacturing procedures have been thoroughly tested, and a completely equipped and expertly staffed metallurgical laboratory is available for special development and test work.

COMBUSTION ENGINEERING

C-411A

General Offices: Windsor, Conn.
New York Offices: 200 Madison Avenue, New York 16, N. Y.

ALL TYPES OF STEAM GENERATING • FUEL BURNING AND RELATED EQUIPMENT • NUCLEAR REACTORS • PAPER MILL EQUIPMENT • PULVERIZERS • FLASH DRYING SYSTEMS • PRESSURE VESSELS

Individuals Noteworthy

(*Continued from page 6*)

Senior Housemaster

MURRAY EDEN, Associate Professor of Electrical Engineering, who has been acting master at M.I.T.'s Senior House this year, has been appointed housemaster. He succeeds Professor Samuel J. Mason, '47.

Professor Eden holds the B.S. degree in chemistry from the City College of New York and an M.S. and Ph.D. from the University of Maryland. He was formerly associated with research at Princeton University, the National Bureau of Standards, the National Cancer Institute, and elsewhere.

Liaison Officer

FRANK T. BAUCHSPIES, '57, has become an M.I.T. Industrial Liaison Officer. He received his bachelor's degree at the Georgia Institute of Technology, and served three years in the Navy on a destroyer, before receiving his S.M. in Chemical Engineering at M.I.T. During the last six years he has had assignments for the California Texas Oil Corporation in Holland, Italy, Bahrain, and New York.

(*Continued on page 46*)

ORIGINATOR

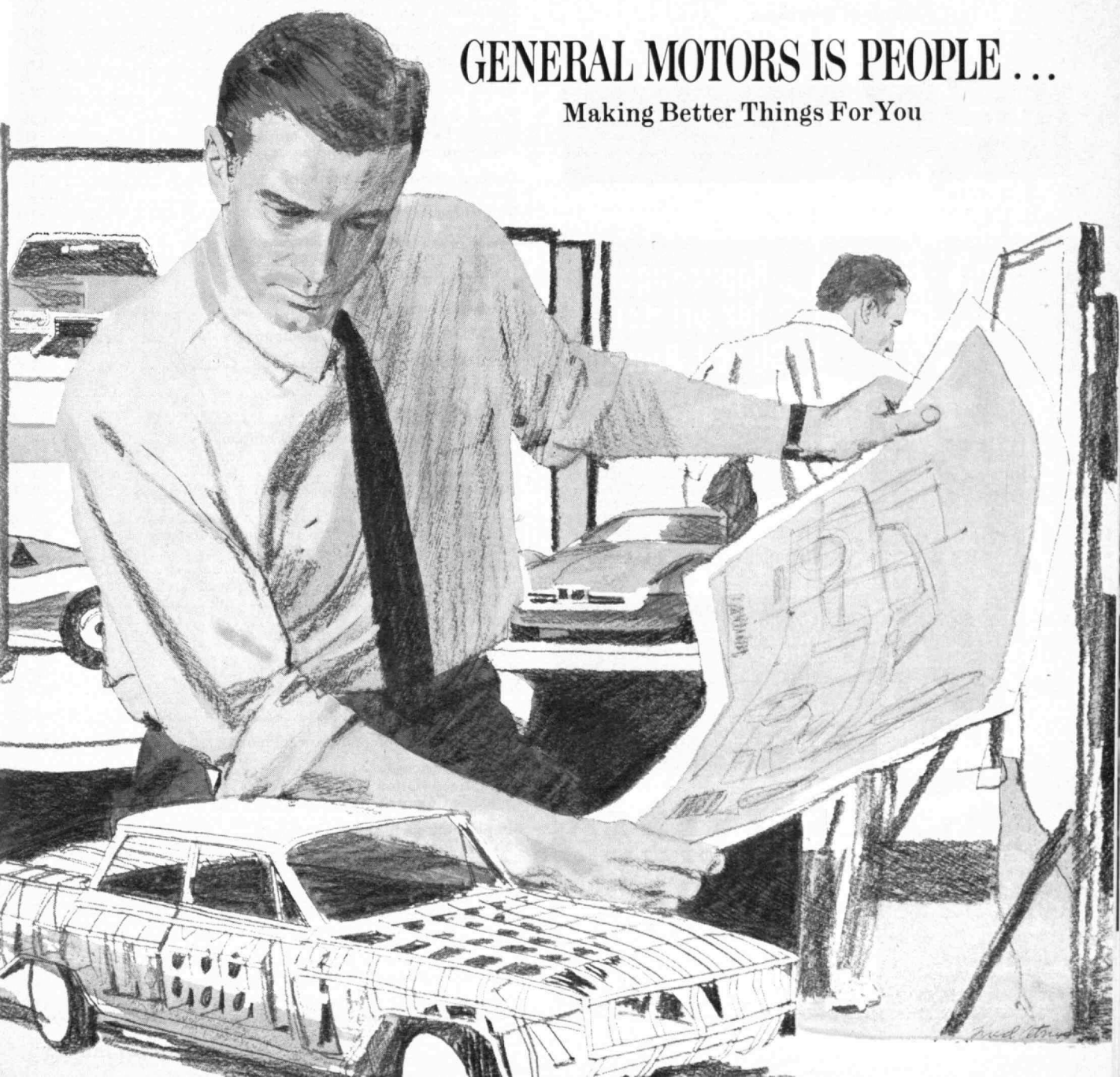
Automotive architect—creative yet practical. This GM designer is contemplating a possible 196-? model car . . . devoting his imagination, creativity and talent to a design of the future. Ideas are his business. Ideas are his life. They are expressed in General Motors products of today —and in GM products for tomorrow.

He is one of 1400 men and women on the GM Styling Staff . . . all dedicated to progress. Their job: to give products eye-appeal . . . and to develop a form exactly suited to each product and its use. They blend design elements such as line, plane, form, color and texture to create the utmost in visual beauty . . . and to enhance quality, convenience and safety, too. They also look far ahead, constantly searching and planning new and better things for the coming years.

The stylist is one of many employes to whom General Motors owes much of its leadership. Collectively, with shareholders (more than a million of them) and thousands of suppliers and dealers, these men and women of General Motors are responsible for GM's progress, past and future.

GENERAL MOTORS IS PEOPLE . . .

Making Better Things For You



Index to Advertisers

June, 1963

Your electrical distributor

replaces all these men

. . . to bring you better products at lower cost

Is this long, long line of salesmen slightly frightening? Actually, it represents just a fraction of the manufacturers who'd be calling on you if it weren't for the centralized supply source created by your electrical distributor. A vital factor in the distribution of products, information and services, he helps you in the following ways:

He lowers your prices by providing warehousing and field engineering for his customers. If your distributor didn't provide these facilities, you'd have to do it yourself at additional cost or rely on manufacturers and lose valuable time on every shipment.

He gives you on-the-spot service and installation assistance. Your distributor is on the job *when you need him.* He often eliminates costly down time through prompt service and expert on-the-spot installation assistance.

He offers "open account" credit service. His knowledge of local business firms makes it possible for him to extend convenient open account billing.

He relays application data to manufacturers that results in new and improved products. Almost invariably, product improvements result in longer service to you at less cost. The electrical distributor plays an important role in feeding back valuable "intelligence" on product performance.

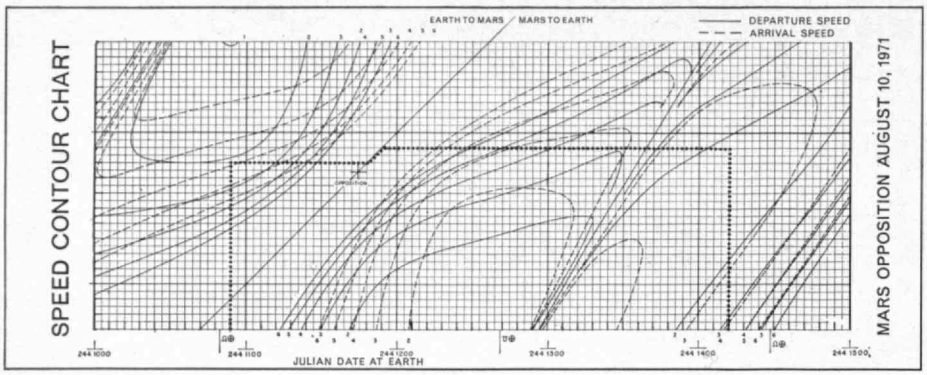
He insures prompt delivery. Unnecessary delays in replacing faulty or worn out electrical components can be costly and dangerous. Your electrical distributor assures fast delivery on all electrical products.

Doing business with a distributor is *good* business for everybody.

Simplex

WIRE & CABLE CO.

EXECUTIVE OFFICES: Cambridge, Mass.
plants at Cambridge, Mass., Portsmouth, N. H.
Westbury, L. I., Monrovia, Calif.



At Lockheed Missiles & Space Company, a dedicated team of scientists devotes its entire attention to problems in interplanetary navigation. Of particular interest are problems attendant to the guidance of a manned vehicle to another planet. With many successful accomplishments to their credit (such as the Polaris and various Agena missions), this group faces every new challenge with confidence.

A promising means for manned spacecraft guidance includes taking celestial and planetary optical sightings, feeding that information into an onboard computer, and computing the spacecraft's position and velocity to predict its future course. The computer will then calculate the predicted destination planet error, decide if a correction is necessary, and compute its value. These procedures would be repeated continually until the planet is reached. The optimum timing and magnitude of correction, in view of the information obtained from the observations, is the subject of continuing study.

Even before work on hardware for an interplanetary mission is begun, orbit characteristics must be determined to set the requirements to be built into the spacecraft. An optimum trajectory must be shaped for the specific mission, in order to realize ultimate effectiveness. An outstanding accomplishment by Lockheed scientists is the computation of some 250,000 different orbits to Mars and a similar number to Venus. Each orbit varies as to speed, fuel, departure, arrival, and elapsed time.

LOOK AT LOCKHEED...AS A CAREER Consider Lockheed's leadership in space technology. Evaluate its accomplishments—such as the Polaris missile, the Agena vehicle's superb record of space missions. Examine its outstanding advantages—location, advancement policies, creative climate, opportunity for recognition.

Then write for a brochure that gives you a more complete Look at Lockheed. Address: Research & Development Staff, Dept. M-47A, P.O. Box 504, Sunnyvale, California. Lockheed is an equal opportunity employer.

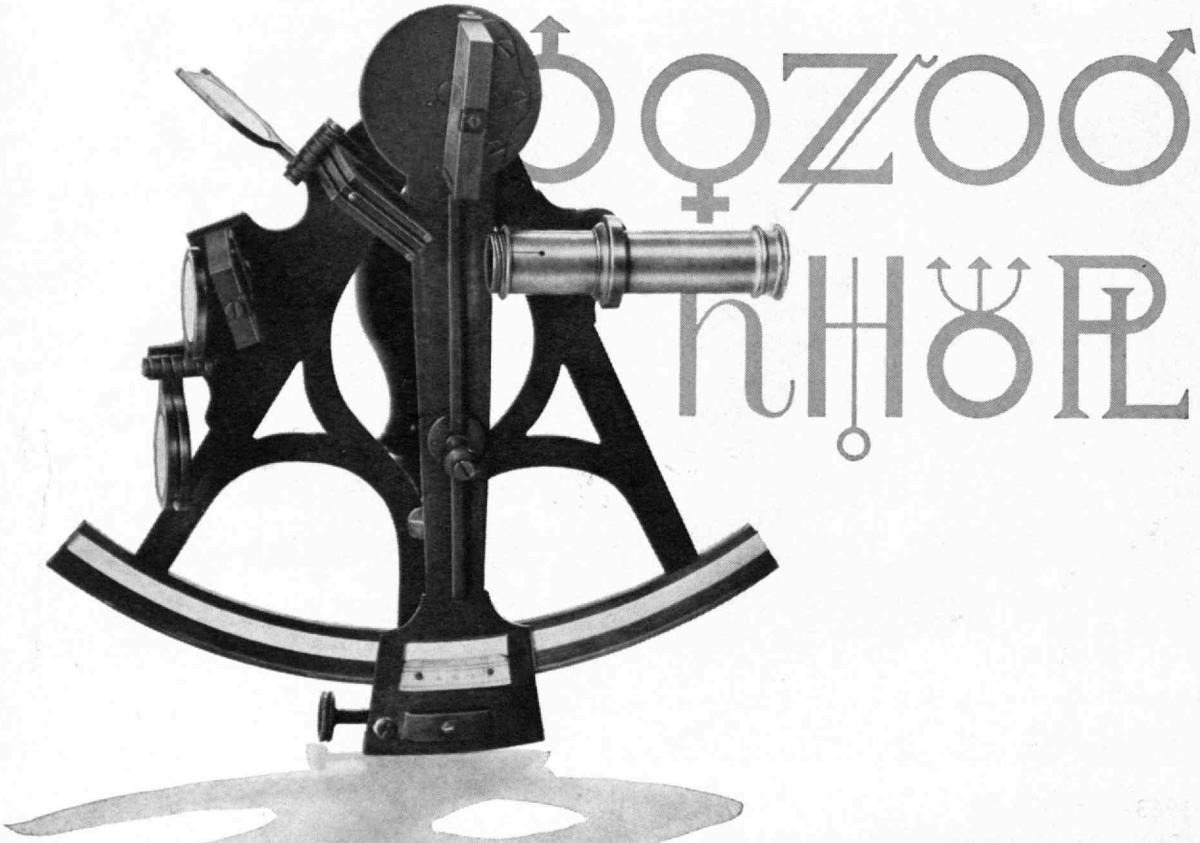
SCIENTISTS & ENGINEERS: In addition to positions relating to flight mechanics, such as mission & trajectory analysis, guidance & controls analysis, other important openings exist for specialists in: Orbit thermodynamics • Electromagnetics • Gas dynamics • Chemical & nuclear propulsion • Systems engineering • Computer research • Electronic engineering • Communications & optics research

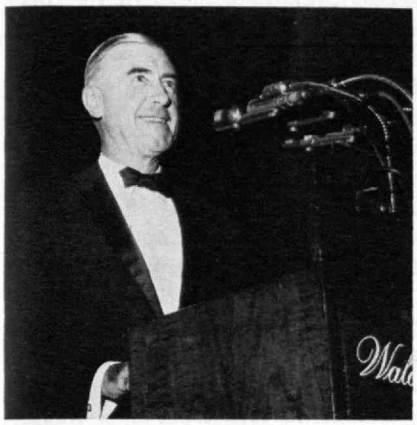
LOCKHEED
MISSILES & SPACE COMPANY
A GROUP DIVISION OF LOCKHEED AIRCRAFT CORPORATION

Sunnyvale, Palo Alto, Van Nuys, Santa Cruz, Santa Maria, California • Cape Canaveral, Florida • Huntsville, Alabama • Hawaii

LOOK AT LOCKHEED IN FLIGHT MECHANICS:

Further advances in space flight leadership





John J. Wilson, '29

$98,000,000 Given to M.I.T.

Corporation honors Alfred P. Sloan, Jr., '95, at celebration of Second Century Fund victory and Dr. Killian calls campaign a "pathbreaker"

ELEVEN HUNDRED business leaders, educators, and M.I.T. Alumni met in New York on May 7:

¶ To hear John J. Wilson, '29, general chairman of the Massachusetts Institute of Technology's Second Century Fund, announce that gifts, grants, and pledges to the Institute from private sources during its campaign totaled $98,000,000.

¶ To salute Alfred P. Sloan, Jr., '95, honorary chairman of the campaign, as "a magnificent leader of men, a brilliant innovator pre-eminent in the field of corporate organization and management, and a philanthropist of exceptional wisdom and magnanimity."

¶ To join Frederick R. Kappel, Chairman of the Board of the American Telephone and Telegraph Company, in congratulating Chairman James R. Killian, Jr., '26, of the M.I.T. Corporation and President Julius A. Stratton, '23, and their associates in "what was probably the most successful fund-raising campaign in the history of American education."

The goal when the Second Century Fund was launched three years ago was $66,000,000. Forty-three hundred Alumni and friends of the Institute were workers in the campaign and $77,000,000 came directly from their efforts. The additional contributions of $21,000,000 from private sources during the campaign also were stimulated largely by the drive and are applicable to the Institute's general objectives as expressed in the Second Century program.

At the Victory Dinner given by the M.I.T. Corporation in the Waldorf-Astoria, Chairman Killian called the campaign a "pathbreaker," the import of which extends far beyond M.I.T., and President Stratton declared: "We have asked your support for a program which we believe will advance science and education everywhere upon this continent."

The most immediately visible results of the campaign are on the Cambridge campus. The $6,000,000 Green Center for Earth Sciences is rising rapidly now, excavation has begun for a $6,000,000 Center for Materials Science and Engineering, new housing for students will be opened soon, and Alumni Day visitors on June 10 will note many other changes. Additional new buildings on which work will begin within a few months include a $4,000,000 Student Center, a $4,000,000 Center for Space Research, and a $6,000,000 Center for Life Sciences.

By exceeding the goal, the Second Century Fund campaign has made far greater changes possible than were proposed in 1960. Two gifts of $500,000 each have been received, for example, for a chemistry building which the Institute now intends to build as soon as further financing is completed.

"Yet the value of bricks and mortar, of stone and steel," President Stratton emphasized at the Victory Dinner, "is derived only from the support they give to the central purposes of the Institute." More than $16,000,000 now has been allocated to enhance the quality of education in M.I.T.'s five schools. Fourteen new professorships have been funded with endowments of about $500,000 each.

Contributions for student aid totaled $10,000,000, and women in particular were assured greater opportunities by other gifts. Stanley McCormick Hall, a new dormitory provided by a $2,020,100 gift from Mrs. Stanley McCormick, '04, is the first one built on the campus for women, and one of the new faculty chairs will be occupied by a succession of distinguished women scholars. This will be the Abby

Alfred P. Sloan, Jr., '95, announcing the establishment of a Center for Advanced Engineering Study at M.I.T. (which is described and discussed on pages 24 and 27).

Rockefeller Mauze Professorship, endowed by Laurance S. Rockefeller, a member of the M.I.T. Corporation, and the Rockefeller Brothers Fund in honor of the only daughter of John D. Rockefeller, Jr.

Members of the Corporation, individually or by foundations, contributed more than $22,000,000, and Dr. Killian called this demonstration of support by the Institute's governing body a major factor in the fund's success. The Faculty, too, contributed generously to the fund, Chairman Wilson emphasized, as did students and Alumni. Campaigns conducted in 66 areas by Alumni yielded more than $8,000,000. Every Alumnus in Puerto Rico contributed.

Business and industry gave or pledged more than $20,000,000, an unprecedented sum representing more than 1,100 grants from more than 500 companies. "Ten years ago this could not have happened," Dr. Killian said, "and even three years ago there were those who said it would not happen."

Approximately 85 per cent of the funds given by corporations, and one-third of the total from all sources, were unrestricted gifts permitting flexibility in the development of the Institute's program.

Dr. Killian's Observations

"The new resources which have been made available to M.I.T.," said Dr. Killian, "represent a mandate by the nation for M.I.T. to achieve its full potential and in its domain, in both teaching and research, to exercise to the fullest its resources for national leadership. Much of what we have received has been given with the expectation that we will employ it in a way that will be useful not alone for our own students and Faculty but to those at other institutions throughout the world. We accept these obligations with humility—and with confidence.

"A conclusion eloquently expressed by the outcome of our campaign is the capability of our privately controlled institutions to discover new resources of private support. Note well the fact that the great sum we announce has come wholly from private sources. Refined prospecting is required to achieve these results; doodlebugs and forked sticks no longer can be depended upon. Instead there must be really important and well-thought-out needs and programs eloquently presented, together with a search technique resting upon knowledge of the sophisticated geophysics of asking and giving.

"Along with the success of recent fund campaigns conducted by other major universities, M.I.T.'s experience convincingly demonstrates how continuingly great and responsive are the resources of private giving in the United States, when programs of unmistakable importance and urgency are persuasively presented. At a time when Federal assistance to education is playing a larger role in both public and private institutions—and M.I.T. is no exception—it has been demonstrated anew that private institutions by boldness and diligence—by blood, sweat, and tears—can attract unexpectedly large support from private sources, that they can still fund their independence and maintain those attributes so important to all education and vital to a free society which arise from the freedom of our private institutions. In this era of mixed support, public and private, the

role of private funds has become more crucial than ever."

Dr. Stratton's Address

Speaking for "the 13,000 men and women who give to M.I.T. its life, its purpose, its dynamic energy," President Stratton stressed the Institute's aims and ideals in his expressions of gratitude at the Victory Dinner.

"First," he said, "we believe that the central mission of M.I.T. is to teach and to contribute a share to the enlargement of knowledge and understanding. We propose to fulfill that mission with energy and imagination, and within our own fields we shall be content with nothing less than a quality of effort that sets new standards of excellence for American education.

"We believe that in the competence and character of the men and women who graduate from M.I.T. we have a priceless contribution to make to the country and to the world. They shall be our return upon your investment.

"With the progress of the times, our concept of the purpose of *undergraduate* education has evolved into a broader view. The complexity of every modern profession is such that we can do no more in these first four years than lay a firm foundation. Whether or not an education may be called liberal or technical is far less a question of subject matter than one of attitude, of treatment, of approach. And in these terms our aim for undergraduate education at M.I.T. is indeed liberal and profoundly relevant to the central problems of our age.

"Consequently we think it our duty to guide the student along paths that will fire his imagination and inspire him to great efforts of his own; to provide him with abundant examples of fine scholarship; to counsel him on the direction and progress of his studies; to furnish him with the most ample resources of laboratory and library; and to afford him the incalculable benefit of an association with first-class minds.

"Undergraduate education at M.I.T. is no longer professional education in the narrow sense. But we do endeavor to impart to our students an understanding of both the privileges and the responsibilities inherent in the professional estate. We have no illusions about the subtle difficulties of this task in a modern university. But we believe that every great institution leaves its imprint upon the character as well as upon the mind of its graduates, and we accept our obligation to cultivate a moral and physical—as well as an intellectual—environment in which will thrive such qualities as judgment, fortitude, and integrity.

"And so we hope first to give to the undergraduate a command of some lasting fundamentals and to excite within him a breadth of interest that relates science to the human, pulsating world around him.

"Secondly, we give him the power that comes from an organized training on how to attack problems that are new and difficult.

"And thirdly, we offer him the only real security, the confidence that comes from intellectual self-reliance—the capacity to keep pace with a rapidly changing world."

Dr. Stratton called attention, too, to the broadening and expanding range of M.I.T.'s academic interests which expresses the belief of its leaders "in the need

Julius A. Stratton, '23, addressing the Second Century Fund Victory Dinner given by the M.I.T. Corporation in honor of Mr. Sloan at the Waldorf-Astoria last May 7.

Victory Dinner speakers (from left): Dr. Stratton, James R. Killian, Jr., '26, Frederick R. Kappel, Alfred P. Sloan, Jr., '95, and John J. Wilson, '29.

for a unity in contemporary society—of a single rather than two cultures."

In allocating funds to new centers and new laboratories, he continued, the Institute's aim has been not merely to follow but to pace the swift progress of science and engineering. "We are thrusting forward in the sub-atomic world and in the universe of space," he said, "we are working on exotic fuels and on novel methods of energy conversion; we are studying the properties of plasmas for their scientific interest and for their possible applications to fusion power and magneto-hydrodynamics. We are exploring the relation of solid-state physics to the development of engineering materials, and the relevance of the communication sciences to physiological systems as well as to electronic predictors and controls.

"In the life sciences, work goes on in molecular and cellular biology, where progress is beginning to yield clues to the secrets of cell division, of abnormal growth, and of the nature and function of the enzymes. We are engaged in neuropsychological research bearing on human behavior, and are pursuing a wide range of studies in the fields of nutrition and food science.

"There is, of course, almost no end to such an inventory. It ranges from the study of management decisions to oceanography; from behavioral studies to planetary science; from high-temperature materials to superconductivity.

"The total body of this research is large indeed; but it is a life-giving force to the institution. It is not something apart from teaching but is completely bound up with the whole process of education. . . . In the long run, we shall be remembered for the men and women we produce and for their influence on society. Everything else is simply a means to that end. It is in that sense that the real impact of the Second Century Fund will be revealed in the development of the kind of citizens we need in a changing world.

"They must be *adaptive,* as well as intensely competent. They must be capable of self-renewal in a world that is constantly renewing itself. Above all, they must have an unswerving set of standards and a personal style that expresses self-respect and dignity.

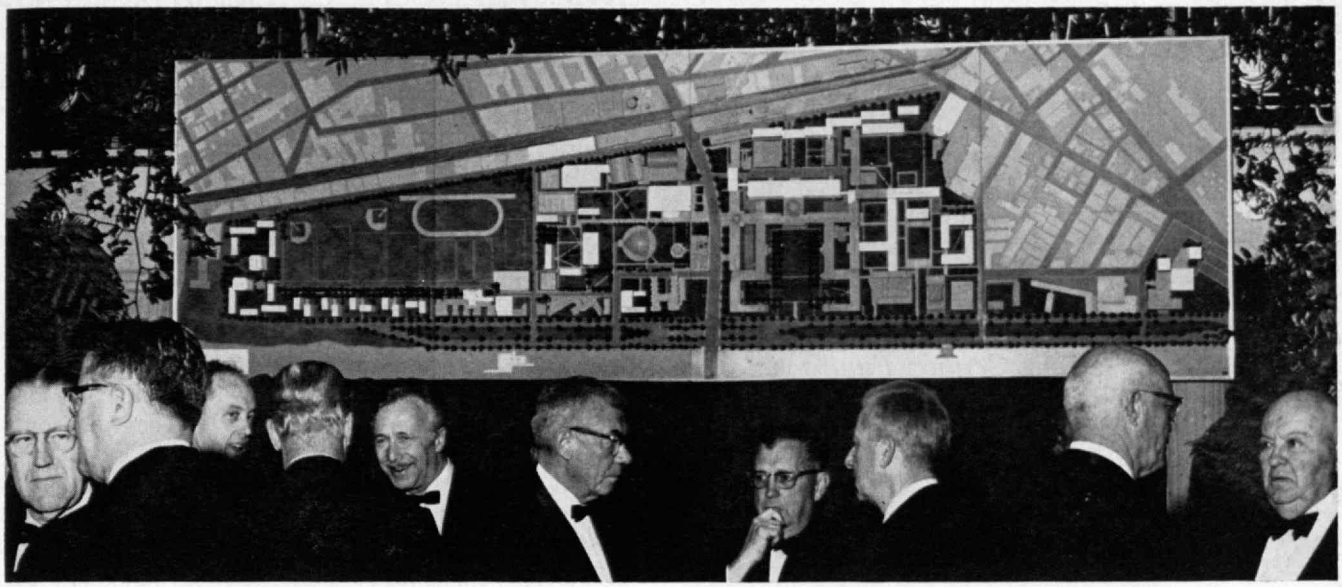
"The compelling charge of the Second Century Program is that we shall use this superb new opportunity to develop such men and women. To the fulfillment of this obligation we pledge our best efforts."

Speakers and Contributors

An Alumnus, the Reverend Samuel H. Miller, '21, Dean of the Harvard Divinity School, gave the invocation at the Victory Dinner. The Reverend Dr. Miller expected to study civil engineering when he entered M.I.T. in 1917, but his schooling was interrupted by the war, and he turned to the ministry after completing his military service.

The principal speaker was Frederick R. Kappel, Chairman of the Board of American Telephone and Telegraph Company, who announced the success of Telstar II in his opening remarks. (*Mr. Kappel's expectations of M.I.T. are reported on page 22; the tribute given by Dr. Killian to Mr. Sloan and the honorary chairman's reply are on pages 23 and 42.*) Mayor Edward A. Crane of Cambridge spoke briefly and gave Mr. Sloan a set of "University City" book ends.

Among the gifts and pledges of $500,000 or more which have been announced are those of the Alfred P. Sloan Foundation, $10,000,000; the Ford Foundation, $9,275,000; Dr. and Mrs. Cecil H. Green, '23, $6,000,000; Mrs. Stanley McCormick, '04, $2,020,100; Mr. and Mrs. Eugene McDermott, $1,285,375; the Campbell Soup Fund, $1,000,000; the Estate of James J. Sheridan, '79, $962,381.63; the Charles Hayden Foundation, $650,000; the Estate of F. P. Von Olker, $608,912.54; the E. I. du Pont de Nemours & Company, Inc., $500,000; Dr. and Mrs. Arthur W. Sloan, $500,000; the Standard Oil Company (New Jersey)—Esso Education Foundation, $500,000; the American Telephone & Telegraph Company, $500,000; The Gillette Company, $500,000; the Longwood Foundation, $500,000; the Martin Marietta Corporation, $500,000; the Old Dominion Foundation, $500,000; H. Nelson Slater, Sr., '15, $500,000; United States Steel, $500,000; Mr. and Mrs. John J. Wilson, '29, $500,000; and 13 anonymous donors to be disclosed later, $11,397,325.



A model of the campus in Cambridge as now envisioned was exhibited at the reception preceding the Victory Dinner for leaders in the Second Century Fund drive.

In reporting these and other gifts, Second Century Fund spokesmen noted that two-thirds of M.I.T.'s present invested funds have been acquired since 1950.

The Second Century Fund campaign began in 1960 with $26,000,000 pledged at the start, and reached the $33,000,000 "halfway point" in February, 1961. It was the most successful effort thus far. The Mid-Century Program campaign in 1948-1951 yielded $26,000,000; the 1955-1956 Karl Taylor Compton Laboratory Program, $7,000,000; and the 1957-1958 Faculty Salary Program, $5,000,000.

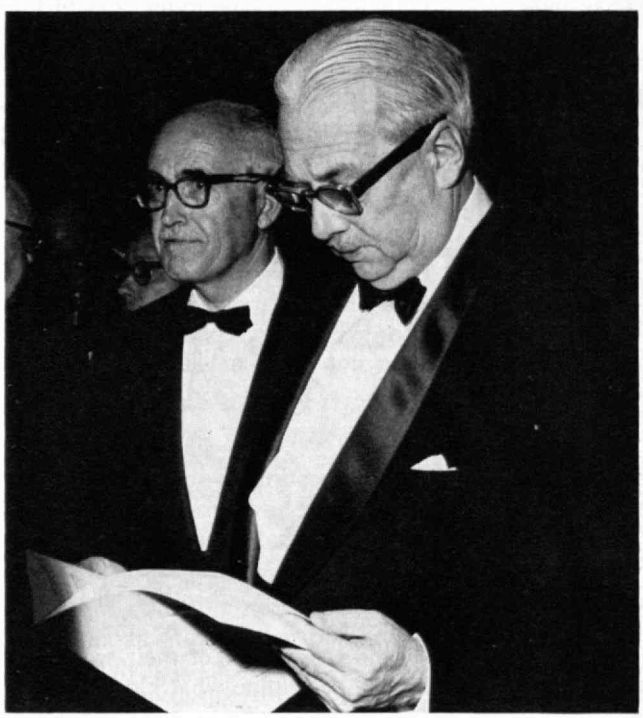
Leaders in the Effort

Mervin J. Kelly of New York led the solicitation of corporations, Walter J. Beadle, '17, of Wilmington, Del., directed solicitation of large individual gifts, and Philip H. Peters, '37, of Boston was in charge of area solicitation of Alumni. Their principal aides included Joseph Harrington, Jr., '30, and Gregory Smith, '30, vice-chairmen of the Area Organization; Earl P. Stevenson, '19, chairman of the Massachusetts Business and Industry Committee; and Marshall B. Dalton, '15, chairman of the Corporation Development Committee.

Students were represented at the Victory Dinner by Jon R. Valbert, '60, President, Graduate Student Council; William McNamara, '60, Chairman, Graduate House Executive Committee; Allen J. Luebbers, '64, President, Undergraduate Association; Henry W. Bowman, '63, Steven J. Glassman, '64, Willliam C. Samuels, '65, and Thomas O. Jones, '66, Class Presidents; and Jason H. Fane, '63, editor of *The Tech.*

Invited to join those at the head table who spoke were Thomas C. Desmond, '09, George M. Humphrey, Walter S. Carpenter, Jr., John T. Dorrance, Frederic G. Donner, Eugene McDermott, Mervin J. Kelly, James M. Barker, '07, Marshall B. Dalton, '15, Walter J. Beadle, '17, Cecil H. Green, '23, Laurance S. Rockefeller, Vannevar Bush, '16, Lewis W. Douglas, '17, Thomas D'A. Brophy, '16, George J. Leness, '26, Luis A. Ferré, '24, and Philip H. Peters, '37.

Also: Arthur W. Sloan, Irving W. Wilson, '11, Nils Anderson, Stephen P. Mugar, William B. Murphy, William S. Paley, Thomas D. Cabot, Charles A. Thomas, '24, Uncas A. Whitaker, '23, Leslie B. Worthington, Horace W. McCurdy, '22, Henry B. du Pont, '23, Stoddard M. Stevens, Gwilym A. Price, Charles B. Thornton, Morse G. Dial, Ralph Lowell, Robert E. Wilson, '16, Harold S. Mickley, '46, Jon R. Valbert, '60, Robert C. Sprague, '23, Kenneth H. Klipstein, Frank L. Horsfall, Jr., James B. Fisk, '31, George M. Bunker, '31, William A. Coolidge, Charles F. Adams, David A. Shepard, '26, Clinton W. Murchison, Jr., '44, John R. Kimberly, '26, Everett Case, Theodore V. Houser, Edward J. Hanley, '24, Earl P. Stevenson, '19, Donald F. Carpenter, '22, and Henry W. Bowman, '63.



Deans George R. Harrison and John E. Burchard, '23, respectively, of the School of Science and the School of Humanities and Social Science, at the victory fete.

Great Expectations

Excerpts from Frederick R. Kappel's address about the M.I.T. Second Century Fund's victory

THE CHAIRMAN of the Board of Directors of the American Telephone and Telegraph Company, Frederick R. Kappel, described the expectations of M.I.T. in the minds of Second Century Fund contributors at the fund's Victory Dinner in New York on May 7. Excerpts from Mr. Kappel's remarks follow:

WE IN THE Bell System had several direct, close-to-home reasons for supporting M.I.T.'s Second Century Fund. One way or another, they all relate to what M.I.T. does to help us advance our business.

In the first place, M.I.T. is important to us as a center of scientific research. The ideas and information it generates help our work in many fields of technical effort. They help us chart our directions. They stimulate our thinking. They add to our knowledge. The relationship between the university and the industrial laboratory really strikes sparks. It is close and it is lively. It nourishes creativity.

Second, a good proportion of the trained manpower we need to conduct our own research and development and engineering effort has come to us from M.I.T. While the numbers are relatively large, I wouldn't try to express the value in numbers. More important is the fact that so many M.I.T. men have been able to contribute substantial achievement and accept large responsibility.

Third, for a good many years now we have been sending small groups of Bell System managers to M.I.T.'s School of Industrial Management to participate in the Sloan Fellowship Program. In my observation, this experience has been of real value to the great majority of these men. When they come back to work, there are few who do not show a visible advance in their capabilities.

☆ ☆ ☆

I believe the quality of education in science and engineering is central to all future progress in this country. It is science and engineering that provide the tools for changing the material conditions of life. And the people who create these tools—the scientists, the engineers—have a unique responsibility to the future. They are key people and the caliber of their work and their thoughts will largely determine what kind of world this is to be.

This is not to say that courses in the liberal arts, in economics, in history, in government, are matters of secondary concern. They are not secondary, and alert schools of technology recognize this. M.I.T. itself has already accomplished a great deal in building an educational environment in which technical studies, broad education in the humanities, and a fine School of Industrial Management all flourish together.

This simply strengthens my hope—in fact my expectation—that M.I.T. will be one of the institutions that will bring new heighth and depth and breadth to the education of scientists and engineers.

☆ ☆ ☆

One thing that I know bothers many thoughtful people (inside the universities as well as outside) is the effect of all the Federal money now flowing to the schools, especially for science and technology. The worrisome thing is that if a disproportionate amount of money and talent is expended for a few purposes, not enough work can be done on other things that are tremendously important too. The same kind of problem exists in many businesses, including the one I am in. We are always having to decide what jobs should come ahead of others.

I am not suggesting that the country today can make the kind of scientific and economic progress it needs without large sums of government money going to the schools for research. I am simply saying that the allocation of all time, money, and effort is a matter of crucial importance. . . .

To be specific, there are at least two parties to every Federal grant of funds. One is the grantor and the other is the grantee. What this means is that the worth of every project is open to critical evaluation and judgment at both ends of the line. And it needs, it must have, the benefit of both judgments. Especially, those who are invited to undertake research and development work must be able to feel that each project lies in an area where their talents are genuinely needed and can be employed to important ends.

There is no question that the people who grant government funds have an enormous responsibility. But the responsibility of those who are invited to accept them is at least equal, and I would say even greater, for no one else can judge as well as they can whether a proposition will result in the best possible use of somebody else's money and their own effort and time.

Here we have in our modern society these magnificent resources of science and technology—resources of a kind never before available in the whole history of mankind. I can think of nothing that is more important—nothing at all—than that they be applied to the full limit of their potential value. These resources are precious. We cannot afford to see any of them wasted —either in industry or in the universities. We cannot afford to see them misapplied. And their most fruitful application, I am convinced, will come only through the exercise of calm, independent judgment of people and institutions that are not thrown off balance by streams of dollars, some of which might just possibly be flowing in the wrong direction.

☆ ☆ ☆

I think the most valuable thing any school can do for a student is to help him get set on a course of continuous personal growth (assuming, naturally, that he has

(Concluded on page 54)

M.I.T.'s Salute to Mr. Sloan

"Motivated by the noblest aims of the nation," he has enhanced "the quality of American life"

THE M.I.T. Corporation's Chairman, James R. Killian, Jr., '26, addressed Alfred P. Sloan, Jr., '95, the Second Century Fund's Honorary Chairman, as follows, at the Victory Dinner at the campaign conclusion:

WE HAVE the honor tonight to salute a distinguished contemporary, a magnificent leader of men, a brilliant innovator pre-eminent in the field of corporate organization and management, and a philanthropist of exceptional wisdom and magnanimity.

His record as an outstanding business statesman and as one of the chief architects and as the long-time executive head of the world's largest manufacturing institution has been perceptively appraised and celebrated, and I need not dwell upon it here. Instead, I speak of him in the uninhibited accents of friendship and admiration. I stress, too, the more recent period of his national service when he has pursued another notable career devoted to enhancing the quality of American life through skillfully planned philanthropy.

We have only to look about us to see the impact of this constructive generosity. Here in New York is the Alfred P. Sloan Foundation, through which he has effectively channeled his philanthropy, and the great Sloan-Kettering Institute for Cancer Research. In universities across the country we find institutes, centers, and buildings, made possible by the Foundation together with basic research programs and fellowships and scholarships aiding outstanding talent.

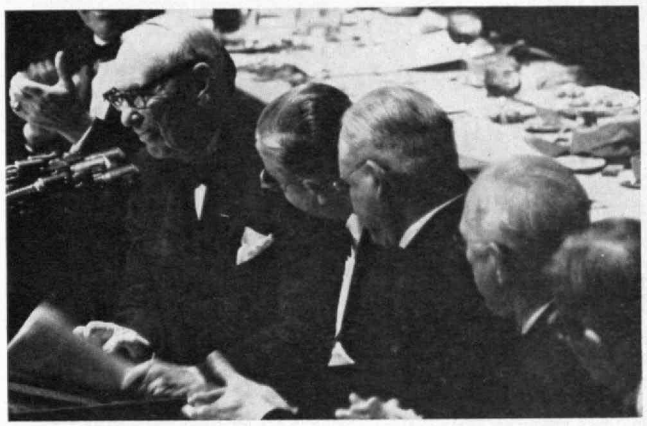
In addition to the Foundation's nationwide program of grants, there has been Mr. Sloan's profoundly influential contribution as one of the pioneer advocates of corporate support for higher education.

Behind each of these programs have been his initiative and innovative ideas, his confidence in the "untransacted destiny" of the American people. Always he has been motivated by the noblest aims of the nation —what Stephen Vincent Benét called

". . . this dream
This land unsatisfied by little ways."

It has been the great good fortune of the Massachusetts Institute of Technology, his Alma Mater, that Mr. Sloan has devoted his talents to its advancement, has brought to it important new ideas for the advancement of education, and has been one of its greatest benefactors. The School of Industrial Management, the Karl Taylor Compton Laboratories, and the pioneering Center for Advanced Engineering Study, just announced— all were initiated by him in its behalf.

The Sloan Fellowship Program at M.I.T., a pioneer executive development program for which Mr. Sloan accepted sponsorship in 1938, is still the flagship of the executive training programs in the United States. In the last decade and a half, he has made clear his sense of the urgency and importance of M.I.T.'s maintaining its independence as a private institution and of its continuing to enhance its resources and leadership in education and research. Our Second Century Fund, on which we report to you this evening, took shape under the spur of his bold encouragement, and its success has been made possible both by his leadership as Honorary Chairman and by his own generous contributions. Through what he has munificently given in funds, he has made M.I.T. a greater institution, but through the bold new ideas he has introduced and the humane affluence of his character and mind, he has endowed it with something greater still.



Mr. Sloan (at left) acknowledging the applause for him.

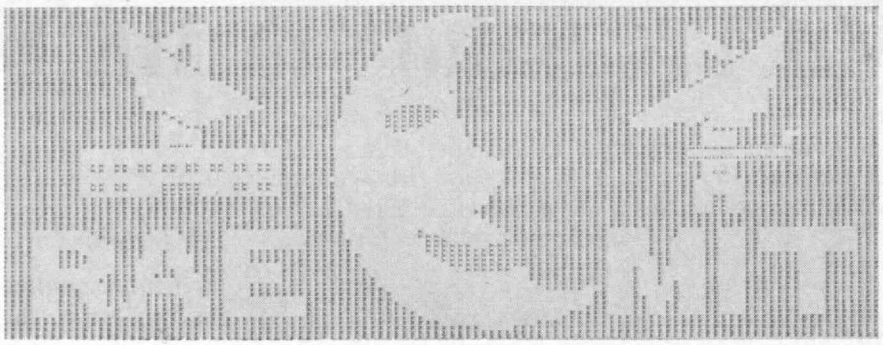
And this is by no means all. Those who have worked with him over the years are well aware of his record as a pathbreaker, of his unfailing capacity to be innovative. Knowing his deeply sincere humility, they also know how unswerving he can be once he has locked onto a course of action he believes to be right. Above all, they know the gallantry and compassionate insight that enriches his relations with friends and associates, and the intense loyalty that binds him to the friends and institutions he cherishes.

These qualities, coupled with his powerful administrative intelligence, place him among the noblest of our great contemporaries.

Mr. Sloan, it is my honor and privilege to say these things in behalf of your friends and associates and to declare this occasion a prologue to your 88th birthday, which comes later this month. Particularly do I present to you the greetings, the congratulations, and the deep appreciation of the Corporation, Alumni, Faculty, and

(*Concluded on page 42*)

Trend Of Affairs



A New Center Is Planned For Advanced Engineering

IN RESPONSE to the need for more engineering leaders able to exploit the most modern concepts of science, M.I.T. will soon establish a new Center for Advanced Engineering Study.

Its purpose will be to give practicing engineers and engineering teachers an opportunity to master frontiers of knowledge which have emerged since they completed their formal schooling. Alfred P. Sloan, Jr., '95, suggested the program last summer in a letter to Chairman James R. Killian, Jr., '26, of the M.I.T. Corporation, and the Alfred P. Sloan Foundation now has granted $5,000,000 to the Institute to finance it for five years.

This will be the first center of its kind in the world and a major addition to the M.I.T. School of Engineering. It will occupy a new $2,700,000 building which will face Massachusetts Avenue in Cambridge and extend from the main M.I.T. building to the Daniel Guggenheim Aeronautical Laboratory. The first class will be admitted in the fall of 1964.

The Center will offer one- to two-week and ten-week courses in specialized fields, and one-year courses to embrace the full benefits that accrue from both study of new sciences and active association with the full spectrum of an academic community. For the first three years there will be continuous experimentation because of the complex problems of developing programs of optimum cohesiveness for experienced men.

In his initial letter to Dr. Killian about the idea, Mr. Sloan noted the success of the program begun by the Alfred P. Sloan Foundation in 1938 for advanced training of young business executives in the M.I.T. School of Industrial Management. He then suggested that there now might be an "opportunity to take young men of equal potentiality for the future who are devoting their effort within some professional area, like chemical engineering, electrical engineering, mechanical engineering, and the like, and offer them a year's supplemental training in the advanced technique of whatever profession they may be engaged in."

Dean Gordon S. Brown, '31, of the M.I.T. School of Engineering, undertook a study of the needs and feasibility of such a program at the request of President Julius A. Stratton, '23, in response to Mr. Sloan's letter. Dean Brown's findings are summarized in the article on page 27 of this issue of The Review.

THE PICTURE above was sent via the moon from M.I.T. Lincoln Laboratory's field station at Camp Parks, Calif., to the Royal Aircraft Establishment at Farnborough, England, during experiments this spring in long-distance data transmission by new techniques.

The $5,000,000 grant to establish the new center was announced jointly by the Alfred P. Sloan Foundation and M.I.T. at a press conference in New York on April 24, at which Mr. Sloan reviewed the background in this way:

"I suppose every one of you appreciates that management, using that in terms of the generalities—and industrial management in particular—has been going through a rapid evolution during the past three decades. It might be well said that it has moved from the concept of operating by hunch to operating by science; and that trend is continuing at an accelerated rate as new techniques evolve from developing technology. A change such as that involves both facilities and people. We are concerned this morning with the factor of people. The efficiency of any enterprise is largely determined by the people involved and how they work together, for, generally speaking, the same facilities are available to all enterprises.

"The people involved might be divided into two categories: first, young recruits entering enterprise for the first time and, second, established people who have been serving enterprise for a greater or lesser period of time. The trend I have mentioned, toward more scientific management, is dramatically illustrated by the young recruits. In my youth—truly that brings us back to ancient history—the educational status of young recruits was limited to the high school; a college education was a great rarity; the graduate school was practically unknown. Today, the young recruit without a college education is hardly eligible for a truly constructive opportunity. The recruit with advanced education in the form of a master's or a Ph.D. degree is now at a premium.

"But while the recruit moves into the established group, technology moves on at an accelerating rate and leaves the professional status of the established people in jeopardy. How are we to maintain maximum efficiency which flows from capitalization of the most advanced technology, when established people are occupied with normal day-to-day operations of enterprise and do not have the opportunity to keep abreast of advancing technology? Right there the proposed program of M.I.T. enters the picture."

Time-Sharing Advances

WHEN the Computation Center at M.I.T. first installed an IBM 704 in 1957, it expected the machine to meet the M.I.T. community's needs with great alacrity. The 704 was replaced by a 709 in 1960, and it gave way later to an even larger and faster 7090. Yet, as machine size and speed increased, the demand for computation service expanded just as rapidly. Computation needs at M.I.T. and at the 42 other New England colleges and universities served by the Center have just about doubled every two years.

A new system called "time sharing,"* is being developed now to enable many persons to use the giant computer simultaneously. Professor Philip M. Morse, the Center's Director, believes this will have enormous impact on the applications and methods of use of computers. At present five, and soon 21, users can give problems to the Center's 7090 at the same time, each one sitting at a separate control console. Eventually more than 100 time-shared consoles, some of them in classrooms and laboratories, will be connected to the central computing facility. Each user will have at his disposal a device which permits instantaneous two-way communication with the computer so that the initial problem may be posed, intermediate results obtained and examined, the problem restructured, if necessary, and run again without delay.

The new development has required a major reprogramming of the machine's operation, says Professor Morse, so that the questions asked by one user will not interfere with the tasks the machine is simultaneously doing for another user. Associate Professor Fernando J. Corbato, '56, the Computation Center's Associate Director, has been responsible for the development of the new system, which already has required six to eight man-years of programming work. Herbert M. Teager, '52, Assistant Professor of Electrical Engineering, has been in charge of design of special equipment for the time-shared consoles.

Experience with the new mode of operation has convinced these experts that time sharing will make it possible to bring the electronic computer to the user—the scientist or engineer or business executive—instead of requiring the user to go to the machine, as is now the case. The new flexibility of use, they predict, will make possible many new applications in theoretical and experimental science.

All told, there are now more than 20 digital computers on the M.I.T. campus. Several departments also have extensive analog facilities. But many programs and problems are too large to be handled efficiently by these machines.

Time-sharing a large computer depends upon its ability, made possible through new compilers and executive routines, to concentrate intensively upon one problem for a very short time (say, 0.02 second), then move on to the next problem, the next, and finally back to the first in a round-robin fashion. It behaves much like a man who reads his mail while telephoning —he never really does two things at the same time, but rather alternates his attention rapidly from one to the other.

* See "Automation, Management, and the Future," Technology Review, May, 1963, p. 17.

The Magnet Laboratory Is Dedicated

FISHERS FOR FACTS and ideas, Professor Francis Bitter pointed out at the dedication of the National Magnet Laboratory on April 30, now have a new resource to exploit and "can look forward to catching some big ones." This $6,000,000 Air Force-sponsored laboratory will have a continuous supply of 10,000,000 watts of DC electrical power when in full operation, and will be capable of generating a continuous magnetic field up to 250,000 gauss in strength and a pulsed field of more than 400,000 gauss. It will be concerned both with the properties of matter in intense magnetic fields and the further development of the magnet art.

Prof. Bitter (left) and Dr. Lax with a solenoid magnet.

Brockway McMillan, '36, Assistant Secretary of the Air Force (for Research and Development) and President Kennedy's nominee to be Under Secretary of the Air Force, was the principal speaker at the dedication ceremony attended by some 250 leaders in science, business, and government. Other speakers included Major General Don R. Ostrander, Commander of the Air Force Office of Aerospace Research; Colonel Jack L. Deets, Acting Head of the Air Force Office of Scientific Research; Eugene Fubini, Deputy Director of Defense Research and Engineering for the Department of Defense; and President Julius A. Stratton, '23, of M.I.T.

The hosts were Benjamin Lax, '49, Director of the new laboratory, and his staff. Dr. Lax and his Lincoln Laboratory associates conceived this laboratory in 1957, and it was established with the co-operation of the existing magnet laboratory headed by Professor Bitter, who serves now as consultant to Dr. Lax and the laboratory's Assistant Director, Donald Stevenson, '50. Alumni will tour its modern home in the former Ward Bakery on Albany Street as part of the Alumni Day program on June 10.

A Tocsin Against Mycotoxins

THE DEATHS of 100,000 turkeys in Great Britain three years ago were traced to a mold that infected peanut meal. Peanuts are a major source of vegetable oil and high-protein fodder, and more knowledge of molds such as infected the meal that the turkeys ate is needed. Studies of peanut mold now in progress in the M.I.T. Department of Nutrition and Food Science have shown that rice, oats, corn, millet, and animal products, as well as peanuts, may support the production of a similar toxin.

A pilot fermentation plant has been set up at M.I.T. to obtain moldy peanut meal toxin in quantities sufficient for thorough chemical and biological study. It is capable of yielding 300 milligrams of crude toxin in six days—a huge harvest compared to amounts produced earlier in other laboratories.

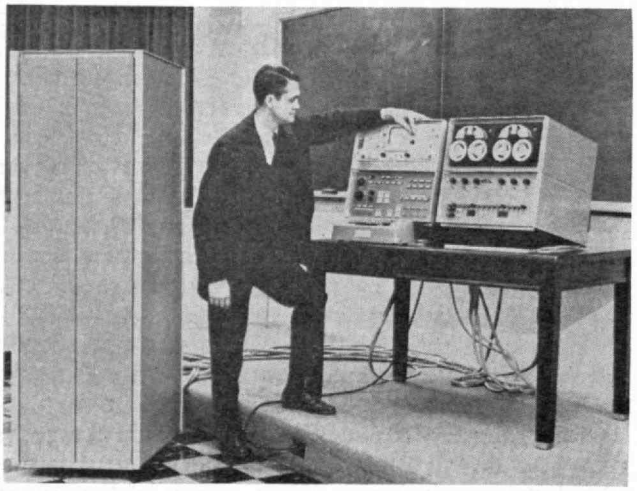
The precise nature of the toxic substances is of intense concern, and Gerald N. Wogan, Assistant Professor of Food Toxicology, has separated 11 compounds which exhibit significant fluorescence under ultraviolet light. These compounds are now being tested individually for their toxicity in ducklings. A dose of only 625 millionths of a gram of crude toxin will cause 40 per cent mortality among the experimental animals.

One may justly wonder, one investigator has noted, how many obscure fungi in our environment develop their toxic products on our foods and play a role in human and animal health. Perhaps, a recent M.I.T. report on research suggested, the advent of peanut mold has served to sound a timely general tocsin against the mycotoxins.

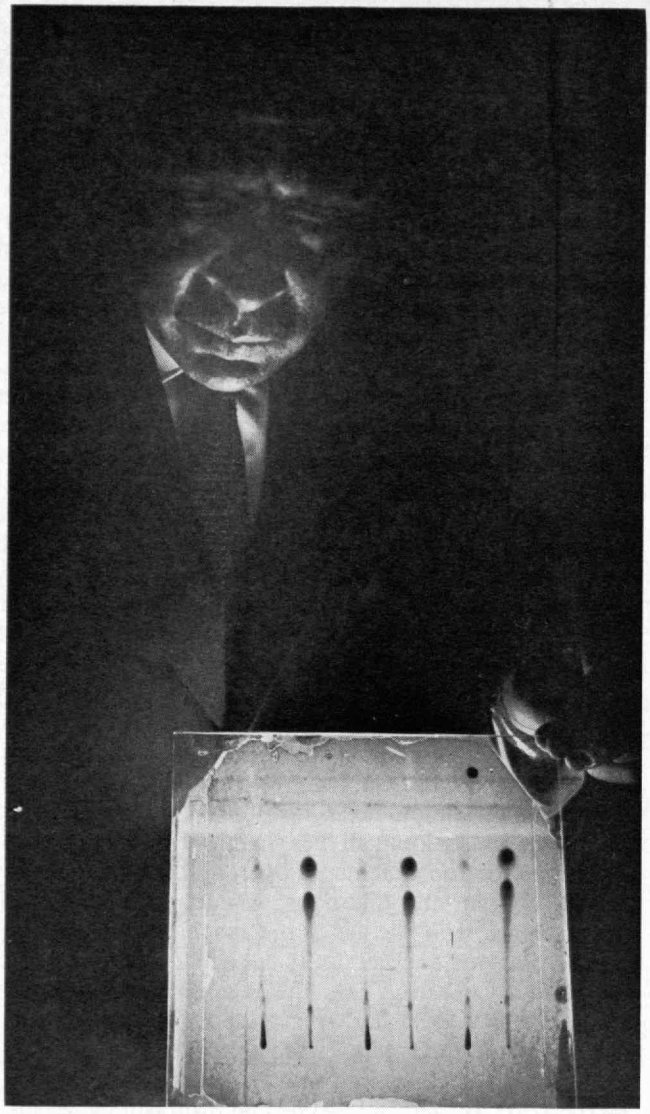
Computers and Health

THE PUBLIC Health Service and the National Aeronautics and Space Administration announced the negotiation of a contract with M.I.T. this spring in the area of computer technology as it relates to biomedical sciences. The contract involves an initial investment of $626,900 for a nine-month period, and is being supervised by Professor Walter A. Rosenblith. Under it a Center Development Office has been set up to:

- Co-ordinate planning for a regional resource center, and
- Evaluate the potential of a specially designed computer for the health-related sciences.



The "LINC" computer for use in health-related sciences.



A chromatogram being used in the study of toxic substances.

The planning activities are to be carried out with the help of multi-institutional advisory committees. They will consider the facilities needed for computer technology and for research in the biological and medical sciences, research programs in which the interests of life scientists and computer scientists overlap, and on-the-job training programs.

The Center Development Office will also supervise the evaluation of a small computer named LINC, which was developed at Lincoln Laboratory by Wesley A. Clark, Jr., '55, and Lieutenant Charles E. Molnar, '61, of the Air Force, and others. About a dozen LINC's are to be built this summer in Cambridge.

Professor Rosenblith is chairman of the Provisional Center Co-ordinating Committee and it includes Mr. Clark, Murray Eden, Belmont G. Farley, '42, George L. Gerstein, William N. Papian, '48, and Thomas T. Sandel.

Back Talk from Cambridge

A GREEN LIGHT on top of Boston's new Prudential Building recently began flashing "New Boston" in Morse code. Soon, a rival beacon on the M.I.T. students' radio tower in Cambridge began flashing in Morse code, too. It said "Old Tech."

(The Trend of Affairs is continued on page 60)

Closing the Engineering Gap

Universities must find ways to fill the chasm between experienced men's capabilities and the explosive growth of modern technology

BY GORDON S. BROWN, '31

Dean, M.I.T. School of Engineering

THE POET who exclaimed "How steep the stairs in strangers' houses are!" described the feelings of many engineers now. Despite the efforts of our professional societies, industry-sponsored training programs, and university extension courses, many of us are nagged by a feeling that we do not have enough advanced education to use the most modern concepts and scientific discoveries in the solution of our problems.

The gap between the technical frontier and contemporary industrial practice is often dangerously large. Many industrialists complain that our country cannot adopt new techniques as rapidly as it should to maintain its position in the international market place. "Requirements for the more highly trained engineers, mathematicians and physical scientists are rapidly outstripping our capability to produce them," President Kennedy noted last year in releasing a report from his Science Advisory Committee—which recommended steps to encourage engineering students to go on to graduate schools.

Narrowing the gap between our rapidly advancing knowledge and current practice in this way is essential, but will take years. It can have little immediate impact. Furthermore, any action to increase the number of graduate students in engineering brings us up against another gap: Teaching at the doctoral level, conducting advanced research, and supervising doctoral theses are tasks that call for abilities that are in short supply.

This situation reminds one of a dog chasing its tail because, as the number of graduate students is increased to meet the needs of industry and government, the colleges themselves will need more men qualified to teach. The colleges will also need more faculty in the next year or two to cope with a sharp increase in the number of high school seniors who will want to study engineering. Inevitably, there will be stiff competition between industry and the colleges for the services of engineers with advanced degrees.

Yet, in this national debate about the crisis in technological education, have we not overlooked something? If the knowledge and skill of selected, key, practicing engineers were updated and reoriented, they would take care of much of the work. We hear from many quarters that technological obsolescence of our older scientists and engineers is at the base of the chronic shortage of high-quality personnel. As the pace of scientific advance continues, the position of engineers in this age group is liable to become progressively worse.

THIS ARTICLE was drawn from Dean Brown's address when made an eminent member of Eta Kappa Nu this spring in New York. He is known throughout the world as a forceful leader among those who are taking steps to offset the hazard of obsolescence that engineers experience because of the rapid growth of technology.

It appears to me, therefore, that the quickest and perhaps the best way to fill the gap in both numbers and capability in both industry and education is to embark on a formal program of updating and reorienting the skills of the most promising men now in industry and in education.

The Dimensions of the Problem

Between 1940 and 1962 our colleges graduated about 600,000 engineers with the bachelor's degree, 93,000 with the master's or engineer's degree, and 10,000 with the doctor's degree. Nearly one half of all of the bachelor's degrees were granted before 1953, or prior to the time when engineering curricula began to take on a stronger scientific base in response to the well-known Grinter Report. About one quarter of the bachelor's degrees were awarded between 1945 and 1950, a period when there was far less emphasis on graduate study than there is today. Hence, it is reasonable to assume that many thousands of engineers who today are in their late 30's or early 40's were graduated from an essentially pre-World War II curriculum. Many of them have had little or no formal graduate study.

To illustrate what this means, I need only say that during the 1945-1950 period few undergraduate engineering curricula included strong courses in the fundamentals of:

1) Modern atomic and nuclear physics, and nuclear engineering;

2) Feed-back control, automation, and inertial guidance;

3) Information theory and advanced theories of communications;

4) Modern computer technology and its penetration into engineering analysis and design;

5) Solid-state physics and molecular engineering, and their impact on the era of solid-state electronics, the exploitation of superconductivity and other properties of modern materials;

6) Plasma physics, its role in the development of techniques for space propulsion, and its potential for new forms for energy conversion;

7) Computer-aided design and numerical control of machine tools as ways to increase the production capabilities of industry;

8) Modern treatments of the interactions of electromagnetic theory with fluid dynamics, with statistical and wave mechanics;

9) Probability theory and its role in engineering decision making;

10) Relativity theory, modern mathematics, etc., and finally

11) Extra-terrestrial sciences.

Many of these areas of science and technology have become professional disciplines of major scope and are having great impact on our military posture and technological strength. But a significant majority of the practicing engineers and engineering teachers, whom we should still call young men, were graduated from college before most of these disciplines were even visualized—and certainly before the scientific bases upon which they rest were taught efficiently. But today's engineering leader is expected, somehow, to master them.

The continued education of engineers is often left mainly to chance. Industry, in its day-to-day concern for profits, tends to operate from one crisis or crash program to another and gives engineers relatively little opportunity to follow technical developments in any breadth. Rarely is an engineer helped to be brought up to date about basic areas in which he never received training. A. C. Montieth, a Vice-president of Westinghouse Electric Corporation and a former President of AIEE, has said that today's graduate engineer has a "half life of about ten years," i.e., half of what he knows will be obsolete in a decade.* Moreover, says Montieth, "half of what he will need to know in '73 is not available to him today."

The number of American engineers who could benefit from updating education totals many thousands. Clearly, we should devise ways to achieve this updating in order to carry the new ideas, the new concepts, the new technologies quickly into our industrial complex.

Students are likely to be swayed by a widely publicized statement that engineers become obsolete in a decade. Had anyone told me, when I was in my late teens, that I would be obsolete and discarded in my middle 30's were I to become an engineer, I probably would have prepared for another career. We hear less often that scientists become obsolete, and the reason may be that the results of their efforts on a particular problem provide the skills to tackle the next one. But, the more successful an engineer is in solving his problems and advancing his specialty, the more necessary it becomes for him to move into some new specialty, or, alternatively, acquire substantial mastery of related specialties. Hence, if we want to attract able youngsters into engineering, we should manage the profession so that the stigma of obsolescence will disappear.

What Are the Needs?

Three major groups, namely, Engineering Managers, Technical Group Leaders, and Engineering Professors, need help:

Engineering Managers now need greater familiarity with such areas of technology as nuclear power, new materials, and sophisticated computers. These new fields interact with the traditional fields, and with new scientific discoveries, in ways that make decision making more complex than it used to be. An engineer can rarely achieve very much any more by working alone. The pulling together of the multitude of diverse skills elevates the team leader's job to a new level of importance. Because of the spectrum of science now embraced by advanced engineering work, one might say that technological unemployment is being inflicted on the very people who are pushing it, namely, the managers.

Technical Group Leaders working in specific technical fields are often unprepared now to work at the level of sophistication that is demanded.

We are all familiar with what has happened to engineers working in aircraft propulsion. Those who developed the piston engine in the late 1930's were forced to switch rapidly to jet propulsion in the '40's and early '50's, to rocket propulsion in the late '50's, now to nuclear propulsion, and soon perhaps even to ionic propulsion.

Electrical and electronic engineers have had troubles, too. They have had to move from the vacuum tube era to the transistor era, to the general semiconductor era. As Professor Campbell L. Searle, '51, and his colleagues at M.I.T. point out, the progress toward miniaturized integrated circuitry demands, and simultaneously makes possible for the first time, a much closer integration between theory, design, laboratory, and production.† As the dividing line between the "device" and the "circuit" inevitably becomes blurred, it becomes increasingly important for the technical leaders to understand deeply and to have working familiarity with the relationship between the internal physics and the structure of a device and its potentialities for circuit performance. Unless an electrical engineer's original college education gave him a solid foundation in such basic areas as atomic and nuclear physics, solid-state physics, structural chemistry, or what today is being called materials science, it is difficult for him to move up to today's frontier by the slow process of self-education.

Professors in Engineering must expand their programs to the doctoral level and, at the same time, provide stronger undergraduate courses integrated around more enduring scientific foundations. Many professors who are about to bear responsibility for increased

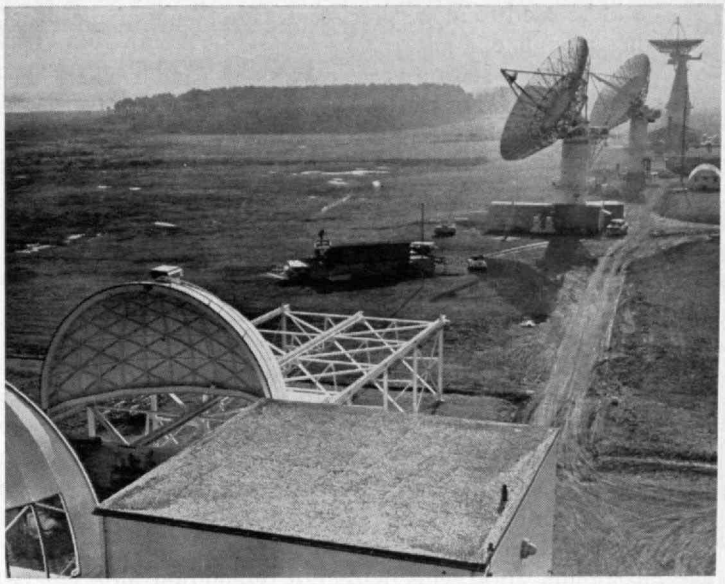
(Concluded on page 44)

**Chemical Week,* March 2, 1962.

†SEEC Notes, John Wiley and Sons, 1962.

To Study Fast, Faint Lights

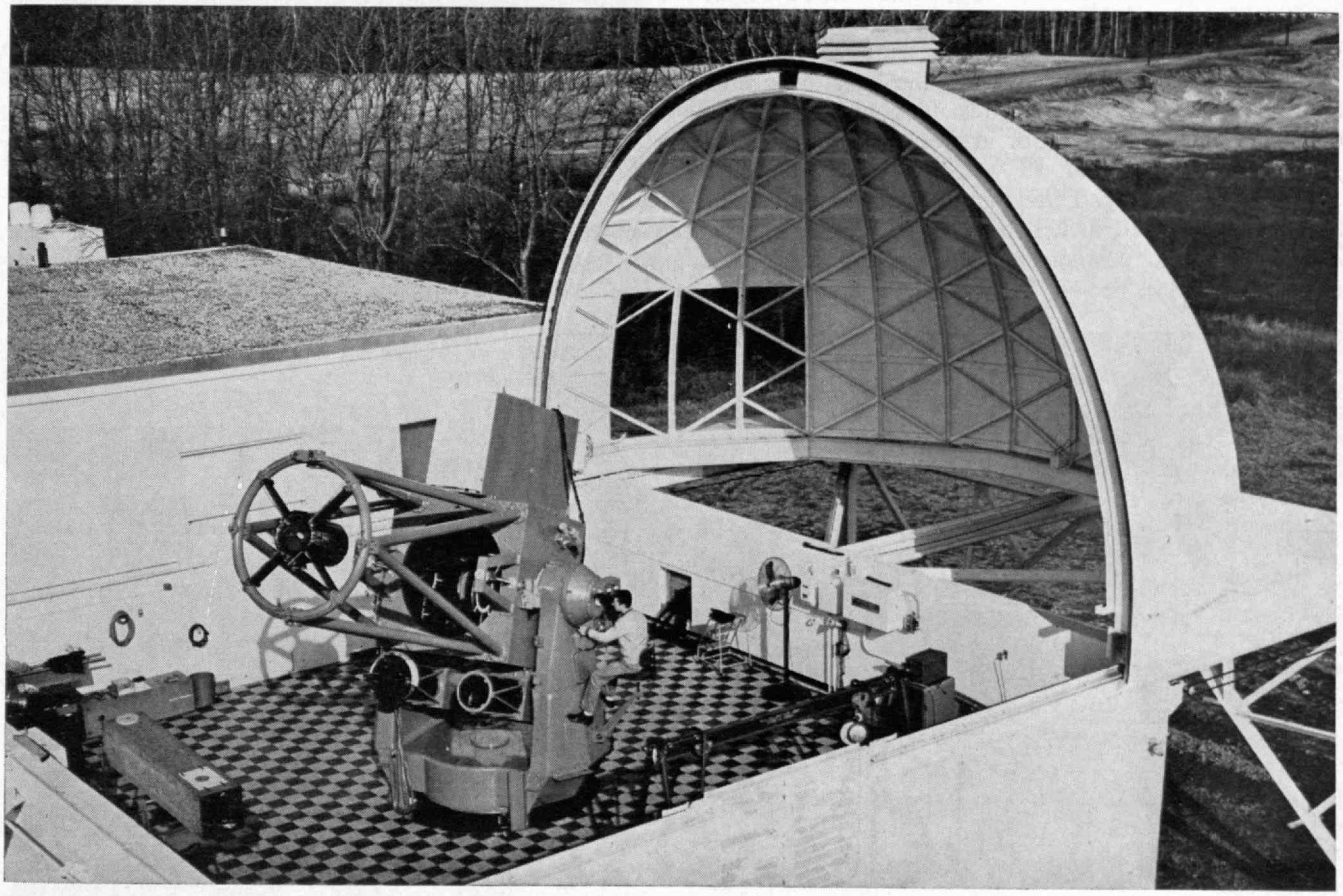
A spectrometric telescope will analyze glow from space vehicles descending to the earth



From left, in this photo of Lincoln Laboratory's field site in Virginia, you see the telescope housing, the S-band tracking radar, combined UHF and X band radars, and finally a long-range trajectory determination and range safety radar.

THE M.I.T. LINCOLN LABORATORY has set up, on the Virginia shore southeast of Washington, D.C., a new spectrometric telescope that its builders believe is the most nimble giant of its type ever built. The world's astronomical observatories have only about 25 telescopes with greater apertures than this one's 48-inch mirror provides. None of them is credited with this instrument's agility.

It is a unique combination of optical, electronic, and mechanical apparatus built to study the glow of an object plunging into the atmosphere with the velocity of a space vehicle or ballistic missile 100 or more miles away. It can automatically track an extremely faint light and at the same time analyze that light. It could analyze the light from a single candle four miles away —but was not built for such simple tasks. It is the instrument with which, a year ago in Lexington, Mass., man-made light was first detected striking the moon. It has been moved to the laboratory's field site at Arbuckle Neck, Va., to meet further challenges. There it



Front view of 48-inch telescope shows 12-inch telescope mounted underneath it at left to guide it, and radiometer at right.

will be used to make precise measurements of the fleeting phenomena now being studied in re-entry physics.

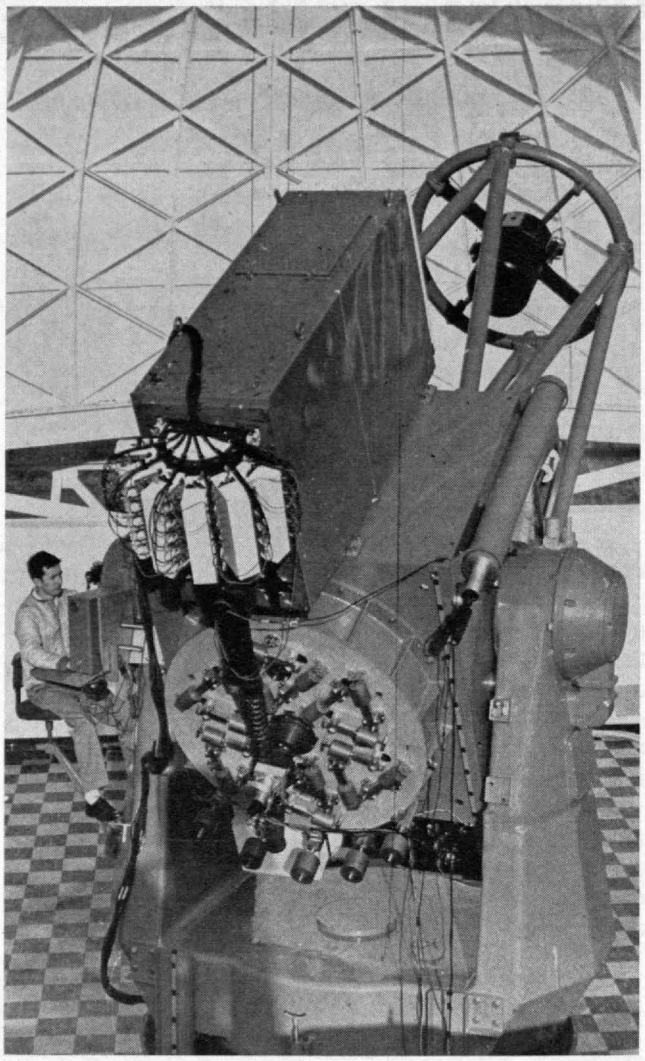
This field station is near Wallops Island, where the National Aeronautics and Space Administration launches multistage research rockets called Trailblazers. They are propelled back toward their launching site at great velocities, and the spectrometric telescope is expected to record details of what happens in such experiments.

Both an object lunging into the atmosphere at high speed and the gases around it soar to extremely high temperatures. Complex chemical changes occur, and a plasma sheath is formed that gives the object a glowing wake. More detailed knowledge of the shock and other phenomena produced by a vehicle's collision with the atmosphere is needed now in the shipyards of space. Data, such as this telescope was built to obtain, will be used both in studies of possible defenses against ballistic missiles and in efforts to devise means of maintaining communication with spacecraft re-entering an ocean of gas such as our atmosphere.

At Arbuckle Neck, Lincoln Laboratory has a battery of powerful radar and optical tracking devices with which the new telescope is intimately coupled. The work is both guided by and providing guidance for related theoretical and laboratory research that Lincoln is engaged in for the Advanced Research Projects Agency under an Air Force contract.

The new telescope is the Cassegrainian type, in which the light collected by a primary mirror is beamed to a smaller secondary mirror, where it is focused down still further and directed back through a small aperture in the primary mirror. After thus going to and fro within this telescope, the light is automatically separated into 40 different bands or channels and measured.

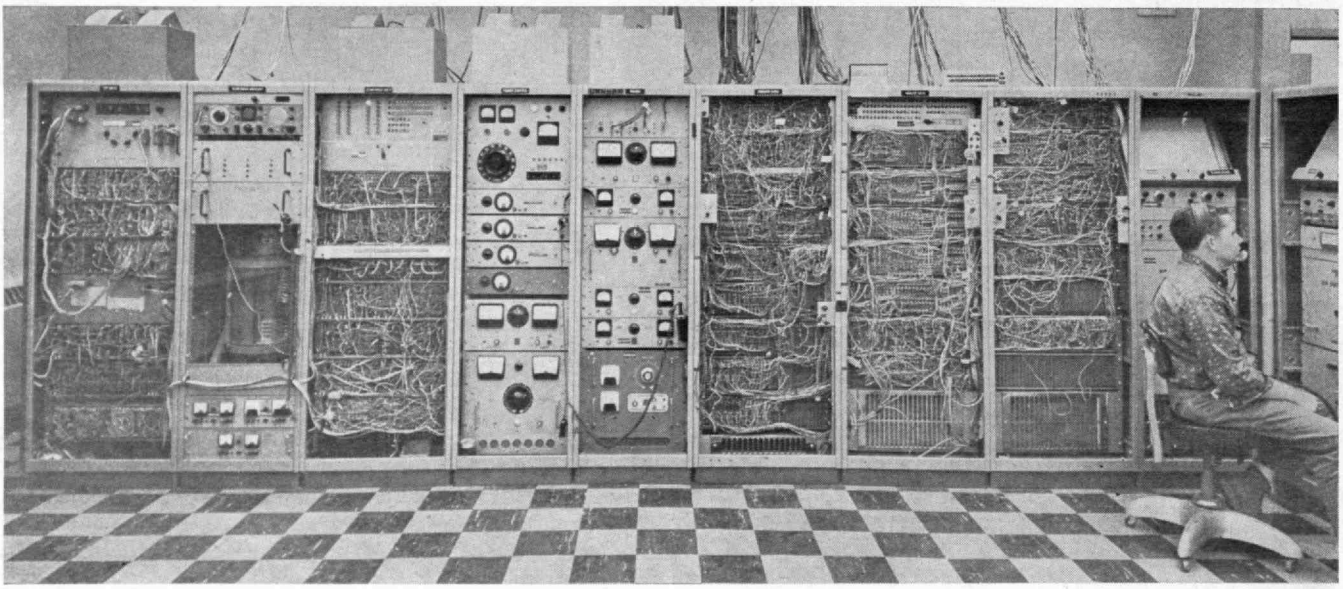
The 48-inch mirror that collects the light to be thus taken apart weighs 1,260 pounds. Its contour is maintained whether it is at rest or in motion by an intricate self-adjusting system of 18 weights which counteract the effects of gravity. This is an f/15 telescope with a focal length of 720 inches, and the light from its big mirror is focused down to an area just over 0.07-inch square for analysis.



Photomultipliers are on top of the telescope. Counterweights attached to rear support 48-inch mirror at various elevations.

The field of view covers only 20 seconds of an arc, which excludes much of the unwanted light from stars and skyglow, but adds to the difficulty of following an

(Continued on page 50)



Part of a multiple-frequency, high-rate digital recording system designed and built at Lincoln Laboratory for use at field site.

For Faster, Accurate Communication

A new digital system using an artificial language behaves as predicted by information theory—and hasn't made an error yet

BY JOHN M. WOZENCRAFT, '51, *Associate Professor of Electrical Engineering*

THE ACCURACY with which human language permits men to communicate is one of its most intriguing aspects. Consider, for instance, how radio hams successfully talk back and forth in spite of the static caused by a thunderstorm.

Even if noise obliterates parts of a speaker's words, the listener usually knows what they were from the context of the message. If the noise becomes too bad, other stratagems help him: The men speak more slowly, more distinctly, and choose their words more carefully. Even if a prolonged thunderclap outside the window makes it impossible for the listener to know what has been said, he at least knows that he did *not* get the message and asks the speaker to repeat it.

People automatically monitor the progress of a conversation in such a way that small perturbations are eliminated, the rate of communication is kept as high as the general noise level permits, and messages blotted out by peak bursts of noise are repeated. Thus, radio amateurs communicate with almost perfect accuracy.

Can computers as well as people do this? Until recently, the answer was not clear. Now a system called SECO has been developed which shows that they can.* It is an experimental communication system which performs feats analogous to those of people using natural languages. It does this by using an artificial language with great speed, efficiency, and accuracy. Thus far it has never made a mistake.

Few realized, when the first large electronic computers appeared, that such a communication system would be needed. However, computers are now beginning to be used in many ways which require fast, accurate communication between them. Air traffic control is an example. Human lives may soon depend on the ability of a computer in New York to notify one in Boston that Flight 809 has been diverted and will enter the Logan Airport landing pattern in 10 minutes at a speed of Mach 2. Ballistic missile defense may become an even more cogent example, with superhuman accuracy required in time too short for human intervention. How to meet communication requirements such as these has recently been studied intensively.

*"Application of Sequential Decoding to High-Rate Data Communication on a Telephone Line," I. L. Lebow, '48, et al., IEEE-PTGIT, April, 1963.

The Computers' Alphabet

Whereas there are 26 letters in the English alphabet, there are only two (usually called 0 and 1) in the alphabet of the language which most modern computers use. Complex messages are built up from sequences of these two binary digits just as we build up sentences from the 26 letters of English. As a simple example, in air traffic control four messages might be represented in *1's* and *0's* like this:

1st message: Go faster	**00**
2d message: Proceed	**01**
3d message: Slow down ...	**10**
4th message: Abort.....	**11**

Similarly eight different messages can be conveyed by sequences of three binary digits, 16 messages by sequences of four, and so forth. Lengthening the sequences permits the use of any desired number of messages.

Systems designed to communicate binary sequences are called digital; the problem is to develop fast and accurate means for transmitting such messages over great distances. Speed and accuracy are antithetical, however, in the sense that unavoidable and unpredictable noise disturbances become more significant as the speed of transmission rises.

Suppose that when the four simple air traffic messages we have considered were being used, noise caused the message "11" to be received as "01" or "10." The consequences could be serious. The danger of misinterpretation can be lessened, however, by specifying that each binary message should be transmitted three times, and action taken if and only if two out of the three received instructions agree. The messages then become:

1st message: Go faster ...	**00 00 00**
2d message: Proceed ...	**01 01 01**
3d message: Slow down ..	**10 10 10**
4th message: Abort	**11 11 11**

Any single digit can now be received in error without ill effect, and if errors occur in such a way that no two of the parts of the received message agree (as in 00 01 11) the receiver at least knows that something is wrong and can ask for a retransmission.

If each message is repeated enough times, this strategy of repetition and majority rule will permit as accurate communications as one might wish—but it takes longer to transmit a longer sequence, and therefore the speed of communication will diminish progressively towards zero as the number of repetitions is increased. In terms of speed, the price of accuracy appears to be high; until 15 years ago it seemed unavoidable that this should be so in digital communication systems.

Information Theory

That arbitrary accuracy can in fact be attained without such curtailment of the communication rate was first shown in 1948 when Claude E. Shannon, '40, published in the *Bell System Technical Journal* an astounding paper entitled "The Mathematical Theory of Communication." He proved in this paper that noise sets a limit, called Channel Capacity, on how high a rate of

communication is possible over a given transmission facility, but that there is no limit on how accurately one can communicate at rates below this maximum. This is the first, and central, result of what has since been called Information Theory.

Shannon showed that, in principle, digital communication systems could have the same attributes that are so helpful to users of natural language in the presence of noise, and could operate much faster than is possible even today using conventional techniques. But the words "in principle" are important, because at first no feasible design for actually building such a communication system was known.

The radio hams' conversation illustrates the nature of the problems that remained. The listener can correct small perturbations because human languages contain constraints: In English, most sequences of sounds are not words, and most sequences of words are not sentences. A listener, consequently, can reconstruct an erroneously received portion of a word or sentence from the context of the remainder. Exactly how people do this is not well understood, but one way to accomplish the same effect in a digital communication system has now been shown.

Two problems, called the encoding problem and the decoding problem, had to be resolved before this could be done. The encoding problem is to impose effective constraints such that all possible sequences of the binary letters *0* and *1* are not allowable words. This is a subject that has been investigated intensively at M.I.T. and elsewhere; in effect, it is a matter of devising spelling and grammatical rules for an artificial language. Among others, Amiel Feinstein, '54, and Professors Shannon, Peter Elias, '44, and Robert M. Fano, '41, have worked on this problem in the Research Laboratory of Electronics at M.I.T., and have shown what can and what cannot be done.

The second problem, that of decoding, at first appears deceptively simple; an obvious decoding procedure is to compare the noisy received message against every possible transmitted message and pick the best match. However, it turns out in general that this brute-force approach is not feasible. Even the human brain could not operate in this inefficient way: Comparing a received speech wave form exhaustively against every sentence that could possibly be spoken would take eons longer than the time-frame of conversation permits. Analogously, the heart of the decoding problem in digital communication systems is to find a better than brute-force method for efficiently processing the noisy received data. Several interesting techniques have been devised for resolving this problem in special cases. One technique in particular, called Sequential Decoding, promises to have quite general applicability.

The Key to SECO

Work on the theoretical aspects of Sequential Decoding has been centered at R.L.E., and work on its design and engineering aspects at the Data Processing Group of the M.I.T. Lincoln Laboratory, under the direction of Paul Rosen. The result is the experimental communication system known as SECO. It is the first one ever built which performs in accordance with the full implications of Information Theory.

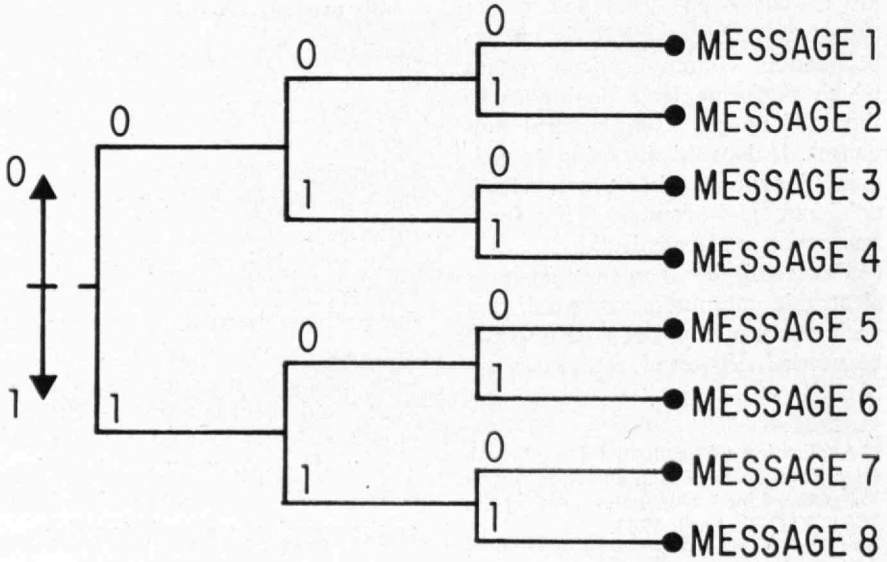
The key to the speed and efficiency with which SECO accurately identifies the transmitted message when it receives a noise-corrupted version lies in the structure of the sequences that represent messages.

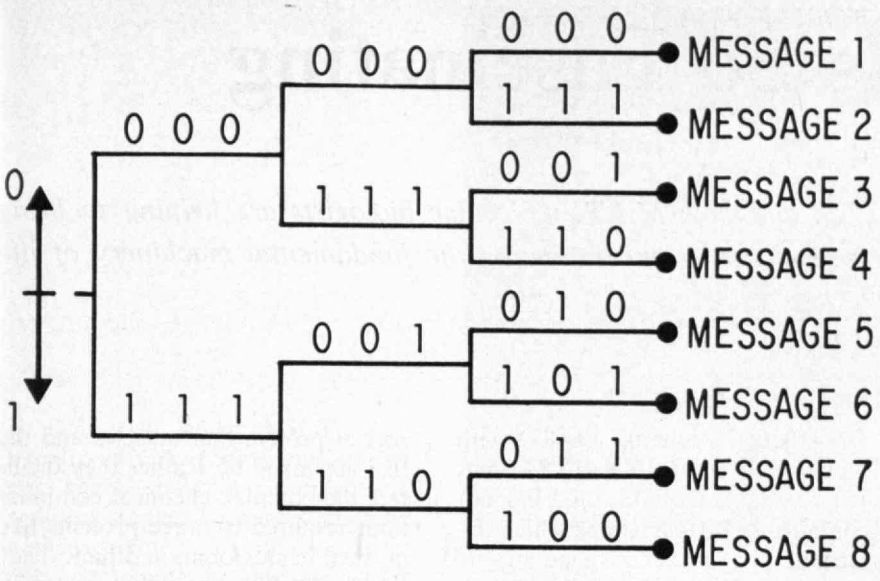
Suppose for a moment that we needed only to be concerned with eight messages. They could be represented by binary sequences of length three, just as the four messages in our air traffic example were represented by sequences of length two. Moreover, we note that such sequences can be laid out not only in straight lines, such as:

000	.....	**Message 1**
001	.....	**Message 2**
010	.....	**Message 3**
011	.....	**Message 4**
100	.....	**Message 5**
101	.....	**Message 6**
110	.....	**Message 7**
111	.....	**Message 8**

but also in the form of a *tree*, or reversed tennis tournament draw as shown below. Each sequence is generated by starting at the left-most node and following the path leading to the desired message number. Binary digits encountered along the way in this tree can be read like road signs, stating at each intersection which fork to take, i.e., whether to go up (*0*) or down (*1*) to reach the desired terminal. For example, if the transmitter sends *101*, the receiver has no difficulty in recognizing it as Message No. 6 so long as none of the digits is received erroneously. To prevent an error when a digit *is* received wrong, however, something more is needed to prevent every possible received binary sequence from corresponding to a possible transmitted message.

How this is done in SECO is shown in a second drawing (at top of the next page). The transmitter still operates by sending each digit encountered along the route to the desired message, but extra binary digits are inserted in an appropriate way along the branches of the tree. If we measure the rate of communication in terms of how many digits lie along each branch (this corre-





sponds numerically to the number of repetitions in the majority-rule scheme considered earlier) these extra digits of course reduce the speed of communication—by a factor of three in the example shown. However, error correction is now possible, and, when the noise is not too bad, we shall find that no further rate reduction is required in order to obtain communication as accurate as we please.

To see that this is so, consider the following example, taken from the tree shown above. Assume that the transmitter sends the sequence corresponding to Message No. 6, but that the first and third digits are received in error. The transmitted and received sequences are therefore:

Sent:	**111**	**001**	**101**
Received:	**010**	**001**	**101**

The SECO receiver in such a case proceeds much like a driver who makes the wrong choice at the first fork in a road, but soon discovers his error, goes back, and tries the other. Since the first three received digits *010* look more like 000 than 111, the receiver initially chooses the upper branch at the first fork in the road. But having made this mistake, it finds thereafter that the rest of the received sequence does not agree well with *any* of the sequences that it can find along subsequent branches of the tree. Consequently, the receiver goes back and tries the lower branch at the first fork. It then proceeds swiftly to the correct destination, Message No. 6.

How effectively such a scheme works depends on the degree to which we can make certain that the receiver, once having turned incorrectly, will thereafter be unable to find any path that agrees well with the received sequence. The chances of its doing so can be reduced by using a deeper tree, with a fixed number of extra digits still inserted along each branch in an appropriate way. When the number of the extra digits per branch is consistent with the average noise, the probability of the receiver reaching an incorrect terminal inadvertently decreases very rapidly towards zero as the tree is extended.

In order to guarantee a negligible error probability, SECO uses a tree that is 60 forks deep, which corresponds if reversed to a tennis tournament with 2^{60} contestants. Since 2^{60} is about equal to 10^{20} (more than the square of the number of people in the world), it is clear why SECO must be built to operate like an intelligent driver on the road rather than to search exhaustively to the end of every possible path.

This account of SECO's procedure is somewhat, but not deceptively, oversimplified. Most of the time, SECO has no trouble in finding the correct message quickly and efficiently. When the noise becomes too bad, on the other hand, it becomes hopelessly confused and asks for a retransmission. Thus it avoids wrong decisions.

SECO's Feats and Future

So that SECO could be tried out in practice, modulator and demodulator equipment was designed to connect it to a standard-quality telephone line running from Lincoln Laboratory to Syracuse, N.Y., and back. Digital information has been communicated over this line for some 40 hours, at all times of day, with great rapidity. Special modulator and demodulator gear was needed for this experiment because that used in conventional systems is designed to operate more slowly.

In operation, the decoded output rate varies between 6 and 9 thousand binary digits (bits) per second. When the channel is especially noisy, the system automatically reduces the transmission rate by increasing the number of extra digits per branch, and then automatically increases the rate again by reducing this number when the noise abates. The average communication rate obtained thus far is about 7.5 thousand decoded bits per second, as compared to the 1.6 to 2.4 thousand bits per second obtainable with conventional techniques. In addition, conventional techniques produce an error probability between 10^{-4} and 10^{-5}, whereas SECO has thus far delivered a billion consecutive bits without any errors at all. Of course, like a person, SECO will ultimately err, but we anticipate that the probability with which it does so will be unmeasurably small.

SECO is still "breadboard" equipment, but it does for the first time provide tangible evidence that the operating characteristics predicted by Information Theory can be achieved in practice.

A telephone line has been used in the experiments thus far simply for its convenience. Work now is under way on application of the ideas that made SECO possible to high-frequency and satellite radio systems, deep-space probes, and high-density magnetic tape recording for computer systems. Recent work by Professor Fano has pointed the way to still more efficient sequential decoding algorithms with less complex equipment.

Shannon's work showed that communication can be basically improved in only two ways: by building a better channel, or by coding and decoding. Both involve expenses: the former for antennas, power amplifiers, and propagation media, and the latter for sophisticated data processing at the terminals. In the future, both approaches will be open to the communications engineer seeking economic and effective solutions to his problems.

Why DNA Is So Fascinating

. . . and how M.I.T. molecular biologists are helping to bring men closer to understanding the fundamental machinery of life

BY SAMUEL JAY KEYSER

THE intellectual history of man is the history of great generalizations: matter is neither created nor destroyed; every action has an equal and opposite reaction; all matter is composed of a handful of elements. A great generalization of our own time, certainly one of the most profound, is that each thing which lives, from the smallest bacteria to man, contains something whose initials are becoming as familiar to us as our own.

DNA stands for deoxyribose nucleic acid; this macromolecule's presence in the nucleus of living cells determines the character, the growth, the replication—in a word the fruition of that cell.

Biochemists discovered the structure of the DNA molecule in 1953. Nearly every schoolboy now learns that the DNA molecule is built like a ladder, the sides of which are composed of alternating sequences of sugar (deoxyribose) and phosphate. The rungs of the ladder are made of nitrogen containing compounds which have a peculiar property that plays a crucial role in the life of a cell. These compounds are adenine, thymine, cytosine and guanine, and their names are abbreviated by biochemists—who are certainly in need of abbreviations—as A, T, C, and G, respectively.

They combine in unique pairs. A combines only with T, and C combines only with G. Somehow each DNA ladder (actually a helix) with its linear array of AT and CG rungs (there may be millions on a ladder) contains the specifications which determine the ultimate shape of the organism, whether it be a bacterium or a bird, a tree or a man.

The question that many molecular biologists, including M.I.T.'s Alexander Rich, Boris Magasanik, Cyrus Levinthal, Salvador Luria, Cecil E. Hall, '48, James E. Darnell, Jr., John M. Buchanan and their colleagues, have given special attention to is, "How does the DNA ladder go about transforming specifications, embodied in the order of its rungs, into the myriad of things the cell will need to build its own brand of life?"

Protein Synthesis

In order to grow a cell must produce proteins; DNA directs their synthesis. Hemoglobin, which carries oxygen in our blood stream, is a protein. Collagen, an important structural component of the human skeleton, is too, as is actomyosin, the fibrous material which enables our muscles to expand and contract. Fingernails, hair, and horn are proteins; so is the white of an egg. DNA is able to tell cells how to make them all.

Equally important is cell production of another kind of protein called enzyme. The enzymes are not the sort of protein that muscles and the like are made of. Rather they facilitate the complex chemical combinations required to make proteins like muscle, hemoglobin, and hair. They are the traffic cops or, if you will, the social secretaries of the cell system, the catalysts which smooth the way for a given reaction without actually taking part in the reaction. Again DNA is responsible.

Asking "How does DNA control the growth of a cell?" poses the question: "How does DNA control the synthesis of proteins?"

Biochemists have long known that DNA resides within a cell's nucleus. Protein synthesis, however, takes place outside the nucleus, in an area of the cell called the cytoplasm where the so-called amino acids, the building blocks which make up proteins, are available. So at the outset a problem arose: if the amino acids are outside the cell's nucleus and the DNA which presumably orders them about is inside the cell's nucleus, how does the DNA manage to tell the amino acids what to do?

The answer, when it came, was surprisingly simple: the DNA sends a messenger. Imagine that something comes along and splits the DNA ladder right down the middle. Ordinarily two such halves would be useless. But not so with the DNA ladder. Since every rung on the ladder is a pair of AT or CG, one can easily reconstruct the other half of the ladder. Since every A must go with a T and every C with a G (and vice versa), the complementary half corresponding to AGCT would be TCGA.

For some reason, however, when one (or perhaps both) of these halves forms a messenger, every T in a DNA half ladder is replaced by a new compound, uracil (U). The messenger strand corresponding to

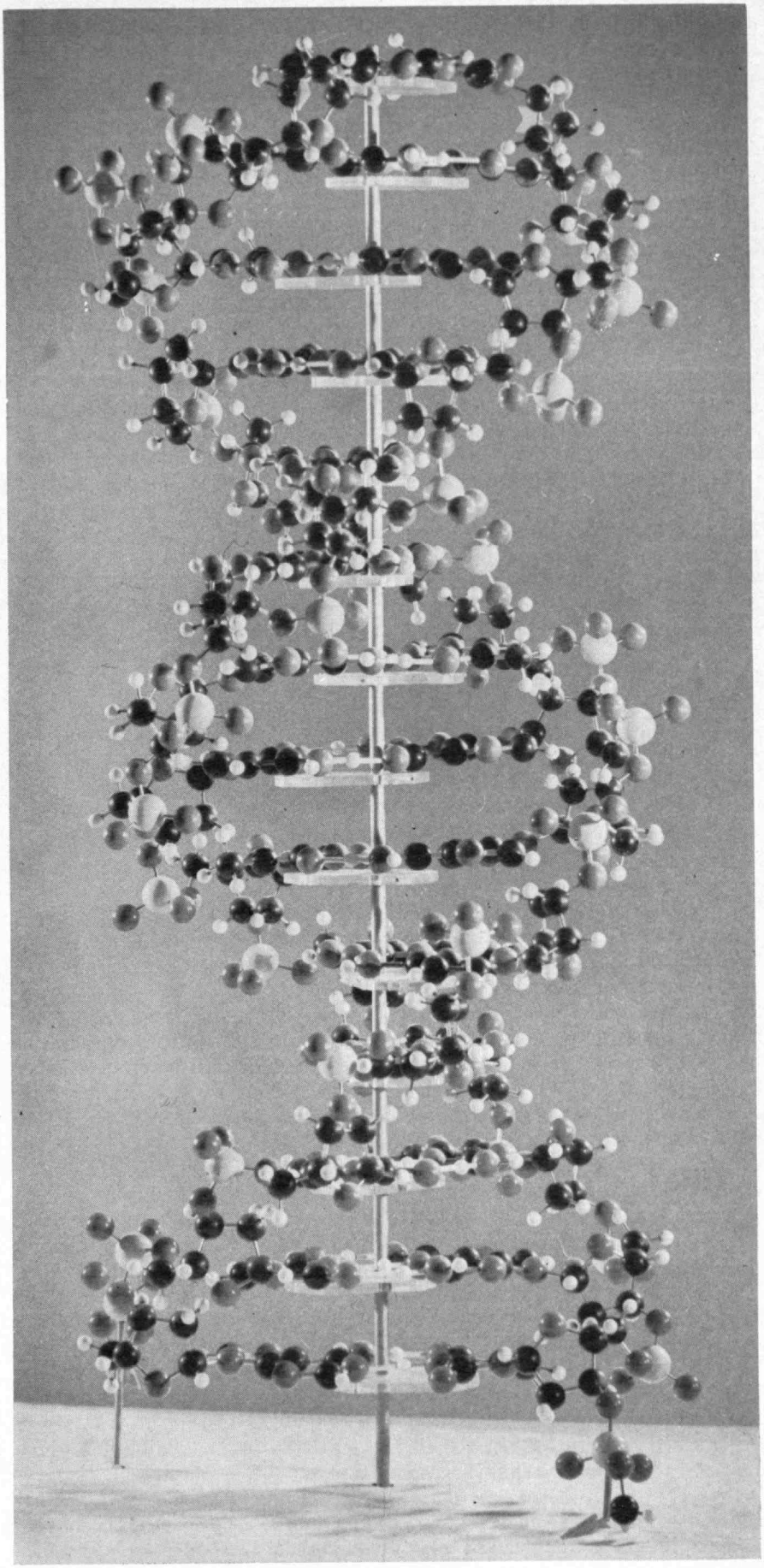
SAMUEL JAY KEYSER is a linguist now serving as a first lieutenant in the U.S. Air Force and currently a guest of the M.I.T. Research Laboratory of Electronics. He has degrees from George Washington University; Merton College, Oxford University; and Yale University. A man of many interests, Dr. Keyser has previously contributed articles to The Review about a computer's handwriting, how frogs catch flies, and the M.I.T. Hobby Shop. He also edits a literary magazine called "The Fat Abbot."

the DNA half ladder AGCT, then, is really UCGA. (Some biochemists have speculated that U replaces T in the messenger because something in the structure of U allows molecules containing it, but not DNA half-ladders without U, to escape from the cell's nucleus into the cytoplasm.) Another difference between DNA and its messenger is in the kind of sugar molecules that link together with the phosphate molecules. The messenger has ribose sugar and differs from the deoxyribose in that it contains one more atom of oxygen. Because of the ribose sugar the single-stranded DNA messenger is appropriately called messenger ribonucleic acid, or messenger RNA.

The peculiar characteristic of complementary half rungs on the DNA ladder not only explains how a single-stranded RNA molecule can contain all the information present in a DNA ladder, but also how a DNA ladder, after being split, can be rebuilt into two separate but identical ladders.

If DNA, unable to leave the nucleus, sends the amino acids a messenger, biochemists then asked themselves, what sort of message does it send? This raised the problem of the genetic code. There are approximately 20 amino acids, but there are only four chemical compounds in the single-stranded messenger chain. What is the coding relationship between the sequence of A's, U's, C's, and G's along the messenger and the amino acids?

If an amino acid were assigned to a single A, U, C, or G, 16 amino acids would not be accounted for. So the relationship cannot be one to one. Moreover, the sequences of A, U, C, and G taken in all possible pairs (AU, AC, AG, AA, etc.) will yield only 16 doublets. Assigning one doublet per amino acid would still leave four of the 20 unaccount-



A model of the DNA molecule in Professor Rich's laboratory is widely admired for its beauty as well as for its utility in biology. How such a molecule controls the production of protein has been the subject of much study.

ed for. So the code relationship cannot be two to one.

Most biochemists have assumed, consequently, that the basic unit along the messenger strand is a triplet of the form AUU, UUA, UAU, etc. Sixty-four such triplets are derivable from A, C, U, and G. With one triplet per amino acid, that is more than enough to go around. Forty-four extra triplets are left. Because of these extra triplets, biochemists believe that the genetic code is degenerate, which means that a single amino acid may be coded by more than one triplet, sometimes two or even three or four triplets.

There are other possibilities, of course. If one were to assume that the basic units of the messenger strand were one letter as well as two letters long, then there would be exactly the right number of units to amino acids, namely A, G, C, and U (4) plus the same letters taken in all possible pairs (16) which add up to 20 separate units, one for each acid. The objection biochemists see to this solution is that given a messenger-RNA sequence, AUC for example, one would never know whether one was reading a sequence A and UC, AU and C, or A and U and C. Of course, if an English speaker were given the sentence "Johnhittheball," he would have no trouble splitting it apart into its proper sub-units, because he knows the grammar of his language. Perhaps the answer to proper segmentation of the genetic code lies in discovering the code's own special grammar. At the moment, however, most biochemists pretty much agree that the code consists of three-letter units and are willing to accept the degeneracy as an untidy fact of life.

The Ribosomal Particles

When the DNA sends its messenger with its unique array of A's, U's, C's, and G's outside the nucleus, the messenger goes to a special place in the cytoplasm which is the site of protein synthesis. This area is called the ribosome and is composed of tiny little particles of ribosomal RNA and protein. Though it was once believed that only one such particle was used in protein synthesis, Jonathan R. Warner along with Professors Alexander Rich and Cecil E. Hall, '48, of M.I.T. have shown that the synthesis of hemoglobin in the bone marrow of rabbits requires clusters of several ribosomal particles, not just one.

Before the discovery of messenger RNA, biochemists thought that instructions for protein formation may have resided in ribosomal RNA. Then they came to realize that the ribosome was merely the site of protein synthesis, that the information was contained in the messenger-RNA strand. But this realization led to yet another question: How do the amino acids, found in abundance in the cytoplasm, get from the cytoplasm to their proper places along the messenger-RNA strand?

The answer came in the form of a remarkable cellular transportation system called transfer RNA. Each amino acid has its own special transfer-RNA strand which combines with it and it alone. Once an amino acid is activated (by its own special activating enzyme), it combines with its own special transfer-RNA molecule. Then the transfer RNA literally hauls the amino acids off to the ribosomal particle clusters and hooks them into their proper places (as determined by the code) along the messenger strand which is resting on the cluster. In 1961 Howard M. Dintzis at M.I.T. (a former research associate) was able to show that transfer RNA actually attaches the amino acids along the messenger strand from one end to the other—and in order. And more recently Howard M. Goodman and Professor Rich have been able to show that transfer RNA, like ribosomal and messenger RNA, originates in the DNA ladder.

Once the amino acids are lined up along the strand, Warner and Rich think that the ribosomal particles travel down the length of the chain causing the amino acids to combine with one another in their own special way to form one long amino-acid chain which is, of course, a protein.

By introducing antibiotics which turn off the synthesis of messenger RNA, Professor Cyrus Levinthal and his colleagues have been able to show that as many as 20 molecules of protein can be synthesized from a given messenger strand before the exhausted strand falls apart. Though protein manufacture may take as long as two to three minutes, great quantities of protein can be manufactured in this fashion since each cell contains millions of ribosomal particles.

A Feed-Back Mechanism

With hundreds of thousands of chemical reactions occurring every moment, biologists have wondered how the cell manages to keep track of everything that transpires within it. It seems reasonable that some sort of cellular inventory is taken, if only because cells operate so efficiently.

One device by which a cell maintains constant surveillance over its internal state of affairs has been studied by Professor Magasanik and his colleagues. An engineer's delight, it is a simple feed-back mechanism which operates in chemical processes of the cell much like a thermostat does in an ordinary house.

A cell must be able to furnish copies of the DNA ladder to be transmitted to other cells. But to do this the cell must first manufacture the building blocks of which the ladder and its rungs are made, the sugar and phosphate links, the A, T, C, and G. Professor Magasanik has studied in detail the ability of the cell to make maximum use of its raw materials in manufacturing these indispensable building blocks.

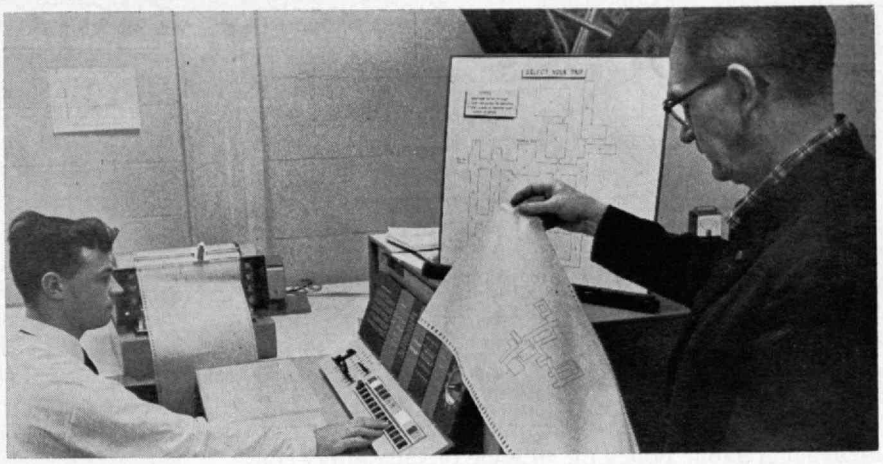
Suppose, for example, seven separate but connected chemical actions must occur in a cell in order to make a certain end product, say the DNA half rung A. For each action to proceed an enzyme must help it along. The heart of the feed-back mechanism takes advantage of this fact, for the enzyme which is present to facilitate the first step in the reaction is itself sensitive to the presence of the very end product it helps to make. This crucial enzyme is able to arrest step one, and therefore the entire process, when it senses that enough A has been manufactured. It can also speed up step one when the supply of A dwindles.

To demonstrate this, Professor Magasanik conducted experiments in which he introduced large amounts of A into cells. The cells' own A-makers ceased to function until the free A was used up. Moreover, if the A-makers produced, say

(Continued on page 56)

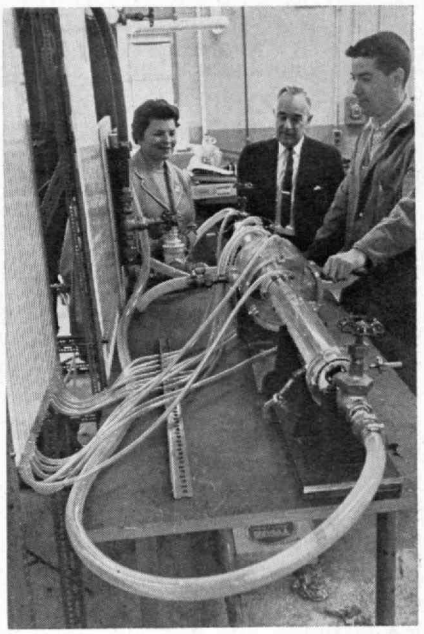
Visitors' Day At M.I.T.

ALL OF M.I.T.'s 22 Departments were open April 27 and thousands of fascinated visitors saw 150 exhibits and demonstrations arranged and given by students. Robert L. Blumberg, '64, and Chester E. Knight, '64, were co-chairmen. Special guests included 2,000 Explorer Scouts from 175 New England posts, for whom there were special lectures and shows.



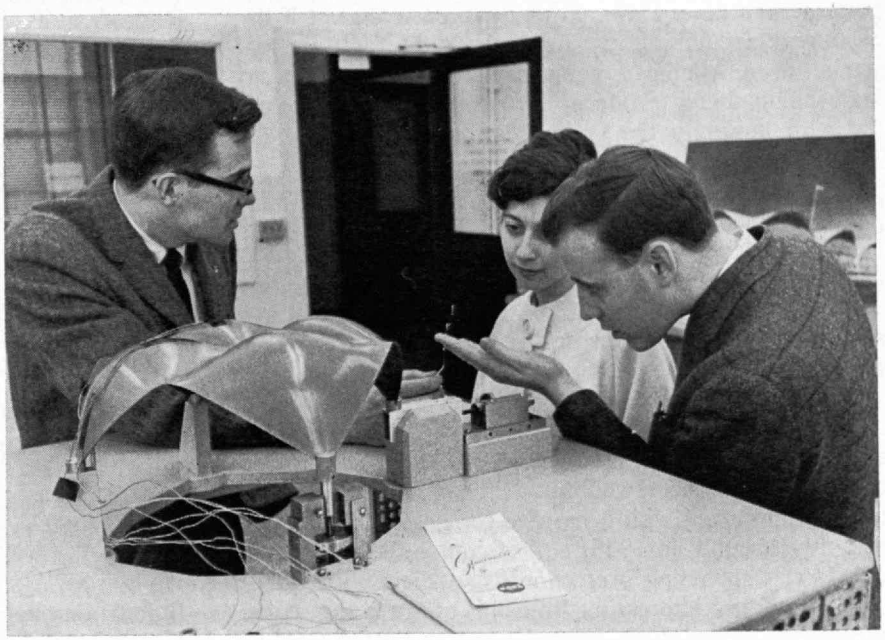
A computer was programmed to show the way from one exhibit to the next.

Professor Harold E. Edgerton, '27, showed some patterns made by sound.



A project in mechanical engineering.

X-ray diffraction in metallurgy.



Keto Soosaar, G, explained a buckling model of an exotic roof design.

New Books

AMERICAN BUSINESS & PUBLIC POLICY, by Raymond A. Bauer, Ithiel de Sola Pool, and Lewis Anthony Dexter *(Atherton Press, $8.95), is reviewed here by Louis M. Lyons, Curator of the Nieman Foundation for Journalism at Harvard, and WGBH newscaster.*

THE AMERICAN business community is ineffectual in influencing public policy on an issue of such direct concern to it as foreign trade. If anyone doubted that, this intensive and elaborate study of the impact of American industry on the foreign trade legislation of the past 10 years demonstrates it. This is not to say that over-all American business interests are not effective in maintaining conservatives in Congress; nor that individual businessmen may not have a strong hand in shaping policy, as we have just seen in the Clay Committee on foreign aid. But, as the research of the authors shows, the businessman is not much of a hand at trying to influence Congress on a specific issue—nor do congressmen feel the need to pay much attention when he does.

The pressures and lobbies of trade associations are a different story. This study raises questions as to how effective they are, and how fully they represent businessmen. On the reciprocal trade issue, the trade associations chiefly represented protectionism. Yet the 900 businessmen interviewed here were about two to one for reciprocal trade, and most of the big ones on that side. The minority for protection, however, were the ones that wrote their congressmen, five to one. With them the issue was specific, to their own product; they knew precisely what they wanted.

One of the most dramatic points made in this study is that the most powerful industries failed to exercise their influence—General Motors, Du Pont—lest they offend customers of other views. Power imposes restraint if its customers are ubiquitous. So we have the fantastic instance of a Michigan congressman influenced by a maraschino-cherry producer for protection, and ignoring with impunity the great free-trade community of Detroit automobile exporters.

A fascinating by-product of this study is its glimpse of the ineffectiveness of the Eisenhower administration in winning conservative support for reciprocal trade, and the consequent failure of Clarence Randall's tremendous effort; and in contrast the success of the Kennedy trade bill, based on the tactic: Don't stir up the animals.

Another bit of political illumination: Congressmen aren't impressed with a mass of obviously organized mail on a bill. That is, the experienced congressmen are not. The Southerners, who don't get so much mail, were naïvely impressed with a barrage for protectionism the first time around, in 1954, and of course the textile industry was sprouting protectionists in their dooryards.

A strong net impression from this study is that congressmen's attitudes are formed much more from habit and tradition than from persuasion: that they listen to those who agree with what they have always thought. These, too, are the people they are most apt to hear from. The protectionist writes to a protectionist congressman. Further, the congressman who votes conservative on one issue is likely to on another.

This reader's impression is that the sea change on trade legislation in this decade has been a change of atmosphere, of national climate, rather than anything induced by argument. Time removed some powerful protectionists. But the rise of the Common Market and the other increasing evidences of interdependence have had the effect of eroding notions of insularity.

This was massive research, over a decade, a key project in the international communications program of the M.I.T. Center for International Studies. Professors Ithiel de Sola Pool and Raymond A. Bauer studied the businessmen and had the collaboration in Washington of Lewis A. Dexter, who studied the way 50 congressmen manage their impossible jobs. His study amounts to a separate book. The rest of the book is a great repository of data on businessmen.

Most interesting, perhaps, are profiles of eight business communities as different as Wall Street and a New England mill town. There are detailed studies of businessmen, and their habits charted and graphed as to the difference it makes whether they are in big, medium, or small business, in what they read, whom they talk to, whether they write letters, and how their attitudes are formed. The net of it seems pretty obvious. Those in big firms with more help write more letters, travel more, have more outside contacts, develop broader views, and are more likely to see an issue nationally, not just as it affects their own business. They are also better educated, and higher education coincided in this study with more liberal trade views.

This book is an immense reservoir of reference, and all of it in practical language, as ready reading for businessmen as for students of the communications of the businessmen.

Have You Seen These Books?

RECENT PUBLICATIONS likely to interest M.I.T. Alumni have included:

Albania and the Sino-Soviet Rift, by William E. Griffith, Lecturer in Political Science at M.I.T. (The M.I.T. Press, $7.95).

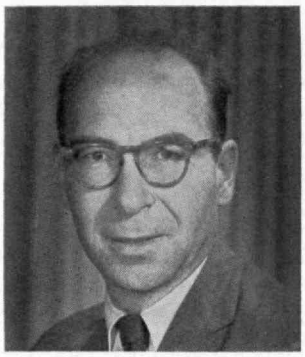
Community and Contention: Britain and America in the Twentieth Century, by Bruce M. Russett, former instructor in Political Science at M.I.T. (The M.I.T. Press, $7).

Ice and Snow, edited by Professor W. D. Kingery, '48; the proceedings of a conference in which C. M. Adams, Jr., '49, R. L. Coble, '55, J. L. Cutcliffe, '59, P. L. De Bruyn, '52, D. N. French, '58, W. H. Goodnow, '61, C. S. Grove, Jr., '34, H. A. Hobbs, Jr., '60, and H. J. Oberson, Jr., '59, were among the participants (The M.I.T. Press, $16).

Operational Economics of Electric Utilities, by Constantine W. Bary, '27 (Columbia University Press, $10).

Plasma Physics and Magnetofluidmechanics, by Ali Bulent Cambel of the Northwestern University Gas Dynamics Laboratory (McGraw-Hill Book Company, Inc., $11.50).

PSYCHOANALYSIS AND HISTORY, Edited with an Introduction by Bruce Mazlish, Associate Professor of History at M.I.T. *(Prentice-Hall, Inc., $2.75), is reviewed by Professor Emeritus B. Alden Thresher, '20.*



Bruce Mazlish

As a conscientious historian, Professor Mazlish has here assembled and published a group of studies that illustrate the potentialities of modern "depth" psychology in interpreting history. This is a more significant action than may appear at first glance. For, as Mazlish points out, professional historians in the respectable academic tradition have maintained, as a group, a quite negative attitude toward the teachings of psychoanalysis. As disciples of Thucydides, they have habitually thought of themselves as psychologists in their own right and, like him, have restricted themselves for the most part to the analysis of conscious, rational motives. So it is not surprising that they have felt threatened by this new science, so alien to their centuries-old habits of thought and to conventional common sense and decency as well.

It was Freud's towering achievement (whatever his lapses in detail) to show that the irrational is a continuing aspect of the normal, and that unconscious motives rooted in infancy can be major prime movers in human affairs. The vital energies of the soul, the "nuclear" forces at the inmost core of personal being, spring from deep sources which Freud was the first scientist to tap, though dramatists and poets had been there before him. Freud, more than any other single figure, has shaped the intellectual climate of our time. Some of his followers, to be sure, have sealed themselves off into closed, dogmatic systems of thought. This, however, is a good reason for multiplying critical discussion, not for a conspiracy of silence.

The prototype of all retrospective, ex post facto psychoanalytical studies is that of Leonardo da Vinci, by Freud himself. This, Mazlish has not included, presumably because Leonardo was not a political figure, and because it is already available in popular form. The core of his book consists of studies of three major historical figures: Martin Luther, Henry VIII, and Woodrow Wilson. To these he adds Machiavelli, who remains a landmark in political thought, though scarcely a towering figure in his own right. Erikson's remarkable book on Luther, too long for inclusion, is sketched by means of two critical reviews.

The lay reader must perforce take on faith both the evaluation of the surviving historical evidence on these men, which is remarkably copious, and its interpretation in the light of psychoanalytic principles, an interpretation inevitably ambiguous, because partly symbolic. Nevertheless, even a reader wholly innocent of Freudian thought must conclude that Luther, Henry VIII, and Wilson were giants, each struggling with a destiny that was not his alone, but was involved with the fate of millions of human beings. He senses that these were men in the grip of titanic inward forces which they did not wholly understand, but the consequences of which they acted out on the stage of history.

Because a major political figure involves so many others in his moral struggles, the roots of these conflicts gain enhanced significance. A heavy professional responsibility rests upon the psychoanalyist who interprets them. For *his* evidence is not documents, but a background of clinical observations against which the case before him can be interpreted. Commonplace material may carry symbolic meanings that strike the layman as implausible or farfetched. The proof must lie in a depth of clinical experience sufficient to clinch the meaning. The theories and techniques are often sophisticated, complicated, tenuous. They touch us in our sensitive areas of repression, resistance, and sublimation. Freud's underlying pessimism has a deep and moving solemnity. Original sin, for the first time, has been shifted from a theological to a scientific context.

Two major papers frame these studies: William L. Langer's 1957 presidential address to the American Historical Association was a call to historians, largely unheeded, to take account of this major, relevant body of thought. Lucian W. Pye's article performs an analogous function for political science, as well as leading directly into an exposition of Erikson's concept of the "identity crisis" as applied to Luther.

All of this forms Part II of Mazlish's collection, and it is the more manageable and focused part. Part I—five papers centering upon Freud's philosophy of history—forms a kind of extended introduction. These pieces range over the really tough philosophical questions which Freud's work poses to all students of ideas and of society—questions so intractable and abstruse as to suggest that this part might well be read last.

"We cannot," said Freud, "do without men with the courage to think new things before they can prove them." "New things" echo through these discussions. "Freud was fascinated and horrified by the power of the past. . . . It lives in the mind, never to perish." We know this is true for the individual; how far does the past live also in our entire culture and in the standards by which we seek to climb out of ourselves long enough to judge what is "normal" or "rational" or "moral" in the individual?

So we sense in the realm of psychoanalysis a significance that transcends objective scientific standards. If the "conjectural history" that Freud conjures up seems at times to carry us into a cloud cukoo land somewhere between actuality and dreaming, it is because he deals with a philosophical dilemma of a higher order than our simple, positivist habits of thought have equipped us to deal with comfortably; these are the deep things of God. Freud echoes A. E. Housman:

> *The troubles of our proud and angry dust*
> *Are from eternity, and will not fail . . .*

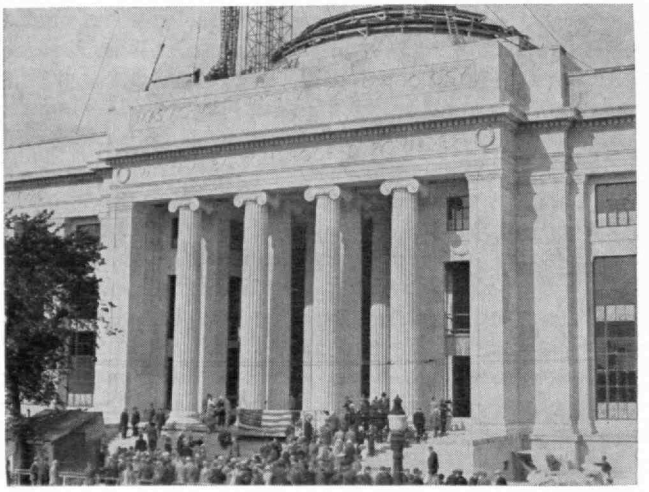
The book, technically, is just a collection of "readings" (and would gain by the addition of an identifying paragraph for each author). But this description does it less than justice. To cram between covers such a clash and reverberation of major intellectual and moral issues is an act of creative scholarship. This is a book to own, to return to, and to ponder.

Institute Yesteryears

As recalled by the late H. E. Lobdell, '17

25 Years Ago

ON JUNE 6, 1938, occurred the Institute's 4th Alumni Day which, like its three predecessors, took place under clear skies. The arrangements made by a committee chairmanned by John E. Burchard, '23, appropriately provided that the events of the morning be held in the *old* Rogers Building, on Boylston Street, Boston, which premises the Institute was to vacate by June 30. At 10 o'clock there was a symposium of four speakers on "The Impact of Science on the Arts"—and at noon in Huntington Hall the ceremonies of "Farewell to Rogers" were held, with Charles E.-A. Winslow, '98, as the orator. Then the scene of activity shifted to Cambridge for the luncheon in Du Pont Court followed by the dedication of the *new* Rogers Building fronting on Massachusetts Avenue and of the Davis R. Dewey Memorial Library, which for the time being was housed in Building 5.



The new Rogers Building on its dedication day in 1938.

In the evening at the Hotel Statler came the 63d Annual Banquet of the Alumni Association—the first of a series to be known as "Stein-on-the-Table Dinners."

¶ The next morning at Symphony Hall, commencement exercises marked the graduation of the Institute's 71st class. Of the 549 degree recipients, 378 were bachelor's of the Class of 1938, 32 of whom simultaneously received the master's degree. The 171 who received advanced degrees alone were divided as follows: 18 doctorates of philosophy and 30 of science, and 123 master's of science.

The academic procession was led by Alexander Macomber, '07, who had been the 35th President of the Alumni Association in 1928-1929; and next came President Karl T. Compton and the commencement speaker, Charles D. Maginnis, President of the American Institute of Architects. At the head of the long procession of degree candiates marched John J. Wallace, President of the Class of 1938, and its three elected marshals: Dale F. Morgan, Frederick J. Kolb, Jr., and George E. Hadley.

50 Years Ago

ON JUNE 10, at Huntington Hall in the Rogers Building on Boylston Street, Boston, 290 diplomas were awarded to members of the Institute's 46th Class—one doctorate of philosophy, 21 master's of science, and 268 bachelor's of science.

The latter were divided by Course as follows: civil engineering, 58; mechanical engineering, 50; electrical engineering, 43; chemical engineering, 30; architecture, 25; mining engineering and metallurgy, 20; sanitary engineering, 15; chemistry, 12; electrochemical engineering, 8; naval architecture, 4; biology, 2; and physics, 1.

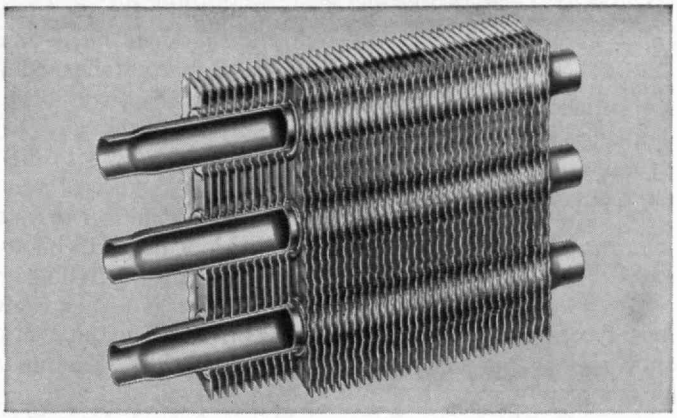
100 Years Ago

AT THE 13TH Meeting of the "Government" of the Institute, the Building Committee, which had been appointed on May 27, reported "on Plans and Estimates for the Main or Central Building . . . unaccompanied by any recommendation."

As set forth in the Minutes, "A long conversational discussion followed relative to suitable permanent accommodations for the Institute, the cost of erecting such, etc., etc. . . . All agreed upon the desirableness, indeed importance of having at least one structure erected with as little delay as practicable, under good judgement: but there was quite a difference of opinion whether to defer the undertaking until the whole amount of funds required for its completion be raised or secured, or to commence the work with the funds which can now be commanded, relying upon the community, in its well-known liberality, to furnish the residue, whenever, or prior to being needed."

The Syracuse Regatta

THE Intercollegiate Rowing Association's distance championship event for eight-oared crews will take place on Onondaga Lake on June 15 near Syracuse. M.I.T. and 14 other schools have been invited to participate, and alumni of all competing colleges will be welcomed at the Stewards' Dinner and Coaches' Reception in the Hotel Syracuse the preceding evening.



B. E. JAMES '32, *President*
JOHN A. MOGA, JR. '57

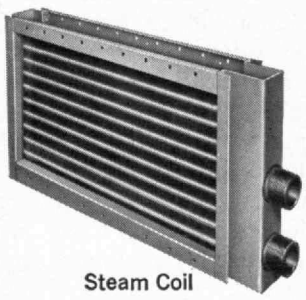
HIGHEST EFFICIENCY... TOP PERFORMANCE

McQuay HI-F COILS

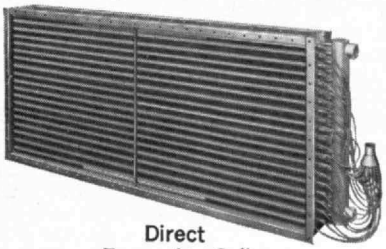
Highest efficiency and top performance are the reasons why more McQuay high-efficiency coils are used to solve unusual heat transfer problems than any other brand. It is not surprising. The famous rippled fin (with full fin collars) and staggered tube construction of McQuay coils provides maximum heat transfer, greater strength, and the longest, trouble-free performance. McQuay high-efficiency coils are available in the widest range of materials including copper, aluminum, stainless steel, steel, admiralty metal, monel, cupro-nickel, and red brass. They are supplied in one or more rows deep, one to 14 fins per inch, and with 5/16", 3/8", 1/2", 5/8", and 1" tube diameters for steam, hot water, chilled water, direct expansion, or special fluids and atmospheres. For the fabrication of coils for special applications, from research through engineering to precise, quality-controlled production, McQuay has more coil experience than anyone in the industry. For the benefit of that experience, see your McQuay representative, or write McQuay, Inc., 1600 Broadway N.E., Minneapolis 13, Minnesota, for additional information.

FOR EVERY HEATING AND COOLING APPLICATION

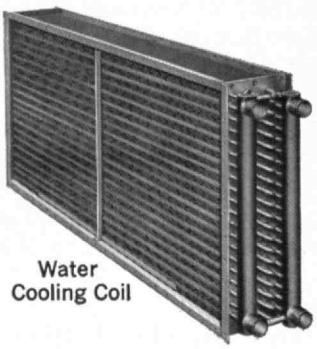
Water Heating Coil



Steam Coil



Direct Expansion Coil



Water Cooling Coil

McQuay INC.
MEANS QUALITY

AIR CONDITIONING • HEATING • REFRIGERATION

MANUFACTURING PLANTS AT FARIBAULT, MINNESOTA • GRENADA, MISSISSIPPI • VISALIA, CALIFORNIA

M.I.T.'s Salute to Mr. Sloan

(*Concluded from page 23*)

students of the Massachusetts Institute of Technology and of all others in this great audience and in their behalf, anticipate the opportunity on future great occasions of voicing our esteem and devotion.

Dr. Killian's remarks were enthusiastically applauded and Mr. Sloan replied in these words:

I THANK you for your generous reception. You have extended to me a high honor and I appreciate it. Dr. Killian's gracious remarks completely overwhelm me. As a matter of fact, I have had a hard time to say anything at all, especially as one always places high value on a tribute bestowed by one's Alma Mater. Dr. Killian certainly presents a story of many of my adventures, in various areas, in support of many causes. I thank Dr. Killian and all who have participated tonight, truly the crowning event of a very long life, and to me a significant endorsement of many things done, things well worth doing. Words can only fail adequately to express my appreciation. So, I say once more, I thank you.

I have always felt a sense of satisfaction in my relationship with the great Massachusetts Institute of Technology. All of us, who have had the rare privilege of being conditioned under its auspices to meet the problems of life, feel as I do that they have incurred an obligation of real significance. It carries with it, to my mind, a responsibility of helpfulness to enhance the welfare of the Institute in all ways, to contribute to it one's talents, one's resources, and one's experience in reasonable measure to that end.

Thus the Institute may be helped to maintain its high academic standards, to strengthen and expand its facilities, to discharge an increasing responsibility to our society, and to accept the penalties of change in this era of great evolution, so that those who now come may enjoy the same high privileges and inspiration as those of us of earlier days.

That, Gentlemen, is all I have tried to do, and in doing so I have taken great satisfaction.

I take special pride in certain of the developments Dr. Killian has mentioned. I proposed the School of Industrial Management some years ago because it was evident that many graduates, passing out of the door of the Institute would ultimately find their way into the area of management. Perhaps I myself present a classic example. As a matter of fact it is difficult, as you know, to keep able, professional people out of management; they just gravitate that way.

Why, therefore, should not the Institute provide the essential training? The School of Industrial Management now fills the vacuum in a masterly way. Leadership is engrained in its curriculum. Notwithstanding its youth, it has established an enviable reputation. We have every reason to be proud of its performance. It certainly is on the way.

I am impressed with the recent announcement of the Center for Advanced Engineering Study. It is a recognition of the basic fact that people become obsolete in the face of advancing technology, just as machinery does. Now we are going to do something about it. We propose to maintain our talent abreast of advancing science and current techniques, thus stabilizing existing organizations and their accumulated experience. I believe such a concept will find a place of significance in a general scheme of the Institute's affairs and will ultimately be recognized on a broader front as a useful instrumentality for maintaining the efficiency of enterprise at current levels. This is truly a leadership project. We need more of those kinds of things.

I venture to suggest that the concept of supplementary education of successful executives of high potential, who have already arrived, was advanced back in 1935 by the late Dr. Compton. He asked three industrial executives—I was one—to stake an executive from industry, as a pilot operation, to find out just what might happen. Through evolution, the so-called Sloan Fellowship Program at the Institute and the Stanford-Sloan Fellowship Program at Stanford University, are both the outcome of Dr. Compton's idea. Both have the strong support of our leading industrial enterprises; both are limited to the area of industrial management. Now we move to broaden the base of the original concept with the new Center for Advanced Engineering Study.

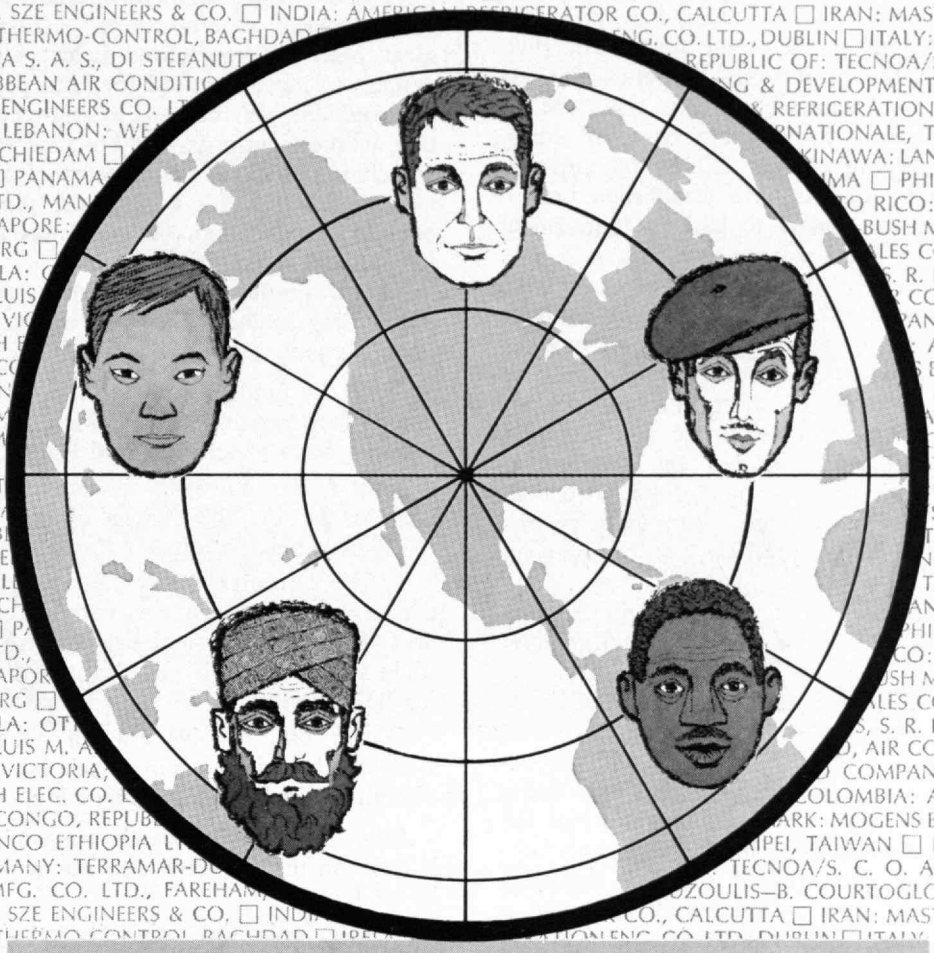
The Karl T. Compton Physical Science Laboratory served to strengthen a basic phase of the Institute's curriculum, but, more particularly, it pays a worthy tribute to that great scientist and educator, the late Karl T. Compton. Dr. Compton, in my judgment, altered the whole course of the Institute's evolution. He was a pioneer. He transformed the Institute from the engineering school of my time to what, through evolution and inspired leadership has become, without question, the outstanding technological institution of all time.

I pick these specific developments only as symbols. History, looking back on us of today, will point out that they, with many others, charted a trend of continuous evolution. If, as we move forward, we draw on our imagination and stimulate our creative powers we shall be convinced that far more opportunities await us. The Institute's objective should be to demonstrate our capacity for leadership on all fronts, to inspire others to follow in our footsteps, that our efforts may be multiplied and our contribution to progress enhanced. Such is leadership in its truest perspective.

I pledge my continued support to that end, and to the very end, so to speak. That, however, is not much of a commitment for, as you probably know, I am creating a huge obligation of borrowed time. Any good banker might well say: the debt has become insupportable. Be all that as it may, I shall continue to be inspired by my tremendous respect for the accomplishments of the Massachusetts Institute of Technology and its future as I visualize it, supported by my admiration of the leadership now directing its destiny.

Dr. and Mrs. Killian in Greece

THE DAY after the Second Century Fund Victory Dinner, Dr. and Mrs. Killian left for a 10-day visit to Greece as guests of the Royal Hellenic Government. Queen Frederika of Greece visited M.I.T. in 1958 and won many admirers at the Institute.



Closing the Engineering Gap

(Concluded from page 28)

graduate teaching, and its associated graduate thesis research, are eager to know where the frontiers are in the newly emerging fields, and what is being done in the science-rich centers of research.

What Is Being Done?

Many individual engineers and engineering professors voluntarily keep abreast of new technology now but, for the most part, only in their own fields. The divisional structure of the professional societies, for example, contributes substantially to this need. Many companies offer in-plant courses and seminars, many engineers attend evening courses offered by universities, and engineering schools have established branch campuses in industrial centers to make it convenient for engineers to take courses in selected areas.

M.I.T. regularly enrolls about 450 people as Special Students each term. These men study only a single subject while it is being regularly offered to our degree-program day students. For the last 13 years we also have offered a series of short intensive courses during the summer on timely scientific and technical topics. Nineteen programs offered by Engineering School professors during the summer of 1962 were attended by about 1,000 engineers from industry and government and about 140 professors from sister institutions.

The General Electric Company has continually updated its Advanced Course and the Creative Engineering Course offered in-plant for its engineers, and during the last two years it also has experimented with a program in Modern Engineering for its executives. Its purpose is to acquaint the G.E. managers with important sciences, disciplines, or technologies now being taught in the schools that were not taught when the managers were graduated 15 or more years ago.

Several companies are sending selected engineers back to school for a year on what may be called a "sabbatical in reverse." The Bell Report—concerning government management of R&D—recommended that the government strengthen its own personnel by sending them back to the university for an academic year every decade.

The schools and the men are finding, however, that this poses some sensitive problems. An engineer who has been away from formal study for a decade or so finds himself lost when put in a class with today's regular students. He needs special methods of instruction. He responds poorly to the regular examinations. Unusual attention must be directed toward motivation when background material is being taught, yet there is a concomitant opportunity for the teacher to exploit the engineer's industrial experience. Both the subject matter and the rate of presentation often must be different than they are in regular courses, and staff requirements for this instruction are considerably in excess of those for normal degree-type instruction.

Where Must We Go?

Survey courses, in-plant courses, night school study, and the concentrated reading of papers in the professional literature on advanced subjects are important. But in the decades ahead the universities must play a continually greater role in furnishing programs for this updating education and for setting the standards of excellence. Because of the wide spectrum of skills found in engineering, because of the need for programs that provide depth for some and breadth for others, and because of the varying lengths of time that engineers can be absent from their jobs, several distinctly different kinds of programs are necessary.

Procedures are needed whereby selected engineers can efficiently undertake one- to two-week courses to meet needs in specialized fields; eight- to ten-week courses to meet the need for both depth and broadening; and one-year courses to embrace the full benefits that accrue from both study of new sciences and active association with the full spectra of an academic community. Because this will require pioneering in a new domain of education, the programs must be imaginative, experimental, and sustained.

There are many reasons why the universities and engineering schools must step up their involvement in these matters.

First, the fundamental business of a university is to evolve doctrines and methodologies to provide the most efficient ways of teaching and learning.

Second, the university is the natural place for an engineer to find the change of pace that is essential to efficient mastery of new intellectual material.

Third, the university is the only place where a student can have frequent access to the teacher. (A weakness of in-plant courses taught by visiting professors, or night school study, is that the student and teacher meet for only about one hour at a time and infrequently.)

Fourth, only a university can make available to the student a broad spectrum of scholars in a multitude of disciplines in science, engineering, and management.

Fifth, a university has the research under way that is truly on the frontiers, and can make it accessible to its students.

Finally, only the university provides a library of sufficient scope to encourage the broadened base of reading that a student should undertake.

At present most attempts to solve the crucial problem of updating our engineers are piecemeal, fragmented, or lacking in certain key elements. The colleges that are called upon to assume some of the burden have neither the funds nor the staff required for the unique syntheses of new technologies that the different situations necessitate. Nor do the institutions have space and facilities appropriately tuned to an effort that will achieve for this new form of advanced engineering study those attributes of taste, quality, and up-to-dateness which will make it truly first-rate.

Many of us wish that these problems would just disappear or that we could walk away from them. But they will increase with time, and too many of us presently underestimate the magnitude of the job. *Chemical Week* found a note of humor in the situation, when it quoted one engineer as having asked: "Why not a tax depletion allowance for the engineer as his mind becomes more and more out of date?" The universities must do their part to make certain that such depletion allowances will not be needed in this country.

In the forest of insurance companies **one** stands out!

Six hundred and sixty-four American companies of all types and sizes write fire coverages. How can we claim one is unique? Here are the reasons.

Manufacturers Mutual is the oldest and largest of the seven Associated Factory Mutual companies, and the company with the lowest net cost. It was founded 128 years ago to serve *policyholders only* and to provide *maximum* protection at *minimum* cost through practical loss prevention procedures.

Throughout the years Manufacturers Mutual has pioneered loss prevention research, education, and control. Although it has refused many applicants acceptable to other carriers, it has grown continuously. Admitted assets are more than 110 million dollars. Insurance in force is over 21 billion dollars — highest total ever for a mutual fire company! Yet loss ratios remain far below industry averages.

Interested? We suggest you get in touch with the nearest Manufacturers Mutual office. A phone call or brief note is all that's necessary. The few minutes either takes could save your company thousands of dollars!

Harvey J. Freeman '16
PRESIDENT

Andrew T. Johnson	'20
Francis E. Slayter	'22
Maurice W. Williams	'22
Kenneth M. Warren	'35
Charles W. Freeman	'40
Roger M. Freeman, Jr.	'44
Colin A. Roberts	'46

Manufacturers Mutual Fire Insurance Company

1500 TURKS HEAD BLDG., PROVIDENCE 3, R. I.

Over $82,000,000,000 insurance in force in the Factory Mutual Companies

The oldest company with the lowest net cost of the seven Factory Mutual F. M. Companies

Individuals Noteworthy

(Continued from page 10)

New Posts

NAMED in the news of promotions, elections, and appointments recently were:

Crawford H. Greenewalt, '22, as a Director, Morgan Guaranty Trust Company of New York . . . *Charles R. Bailey, '23,* as Comptroller, Minnesota Power & Light Co.;

Frederick J. Hooven, '27, and *George D. Latimer, '49,* respectively, as Director, Research Planning Office, and as Assistant Divisional Controller, Ford Division, Ford Motor Company . . . *Arthur R. Elliott, '28,* as Chairman, Industrial Development Board of Greater Winnipeg;

Edward McL. Tittmann, '29, as Chairman and Chief Executive Officer, American Smelting and Refining Company . . . *Ralph W. Peters, '30,* as Vice-chairman, Paper and Board Manufacture Division, Technical Association of the Pulp and Paper Industry (TAPPI) . . . *Arthur A. Smith, '31,* as Vice-president, Stone & Webster Engineering Corporation;

Lawrence C. Hall, '35, as a Director, New Hampshire Insurance Company . . . *Colonel Roman I. Ulans, '36,* as Commanding Officer, U.S. Army Electronics Materiel Support Agency . . . *John A. Doremus, 4th, '38,* as Chairman of the Board and Chief Executive Officer, Polytronics Laboratories, Inc.;

Saul Jacobson, '38, as Senior Vice-president, Brunswick Corporation . . . *George A. Schroeder, '39,* as Executive Vice-president, Clipper Ship Products Inc., Waltham . . . *Kenneth A. Roe, '41,* as President, Burns and Roe, Inc.;

Walter L. Threadgill, '41, as Assistant Manager, Baton Rouge (La.) Plant, Dravo Corporation . . . *John W. McNall, '42,* as Manager, Advanced Development, Lamp Division, Westinghouse Electric Corporation . . . *John C. Stetson, '43,* as Vice-president and General Manager, Houston *Post;*

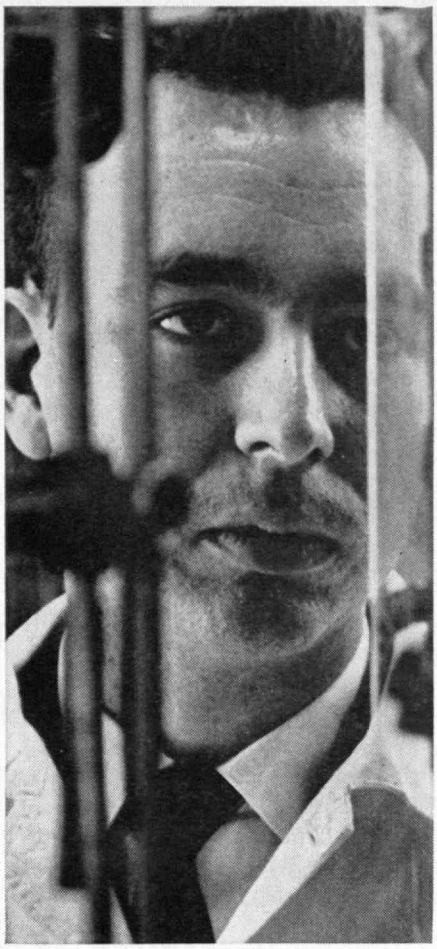
Richard O. Braendle, '44, as Assistant Manager, Sales and Planning, Petroleum Chemicals Division, E. I. du Pont de Nemours & Company . . . *Joseph J. Schaefer, '44,* as Treasurer, Chas. T. Main, Inc. . . . *Roger P. Sonnabend, '46,* as a Director, Norfolk County Trust Company;

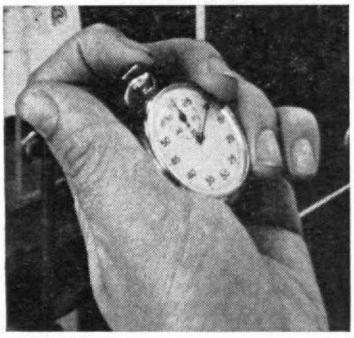
George W. Smith, Jr., '47, as Vice-president, Westinghouse Air Brake Company . . . *Robert P. Abelson, '48,* as Professor of Psychology, Yale University . . . *Charles A. Whitney, '51,* as Associate Professor of Astronomy, Harvard University;

Frederick R. Cronin, '53, as Manager, Digital Development Department, Government Products Division, Adler Electronics, Inc. . . . *Frederic D. Randall, '54,* as Managing Director, Dista Products Limited, Speke, England . . . *Marlin P. Nelson, '57,* as Manager, Advanced Management and Methods Division, Sun Oil Company;

James H. Simons, '58, as Assistant Professor of Mathematics, Harvard University . . . *Donald F. Mudgett, '59,* as Assistant to the General Manager, Phillipsburg and West Eaton Plants, Ingersoll-Rand . . . *Gerald C. Pomraning, '62,* as Manager, Theoretical Physics Unit, Vallecitos Atomic Laboratory, Atomic Power Equipment Department, General Electric Company, San Jose.

(Concluded on page 48)





Our gasoline isn't good enough for some people...us

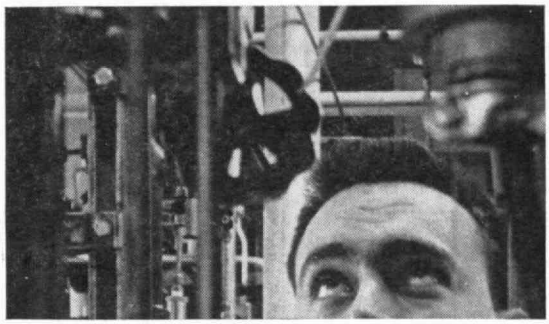
We like to think that American Oil products are the best you can buy. And they are. We also like to think we can improve the quality of our products without increasing the cost to the consumer. And we do. Consistently.

A considerable amount of work is done in testing catalysts and searching for those which will help produce the types of gasoline our customers want at the price they can afford.

One of the people engaged in the research and development of our manufacturing processes is John Mitchell, 24, a graduate Chemical Engineer from the University of Texas.

The opportunities for bright young scientists like John Mitchell are virtually unlimited at American Oil. American Oil offers a wide range of new research opportunities for: Chemists—analytical, electrochemical, physical, and organic; Engineers—chemical, mechanical, and metallurgical; Masters in Business Administration with an engineering (preferably chemical) or science background; Mathematicians; Physicists.

For complete information about interesting careers in the Research and Development Department, write: J. H. Strange, American Oil Company, P. O. Box 431, Whiting, Indiana.



IN ADDITION TO FAR-REACHING PROGRAMS INVOLVING FUELS, LUBRICANTS AND PETROCHEMICALS, AMERICAN OIL AND ITS AFFILIATE, AMOCO CHEMICALS, ARE ENGAGED IN SUCH DIVERSIFIED RESEARCH AND DEVELOPMENT PROJECTS AS:

Organic ions under electron impact • Radiation-induced reactions • Physiochemical nature of catalysts • Fuel cells • Novel separations by gas chromatography • Application of computers to complex technical problems • Synthesis and potential applications for aromatic acids • Combustion phenomena • Design and economics: new uses for present products, new products, new processes • Corrosion mechanisms • Development of new types of surface coatings.

AMERICAN

AMERICAN OIL COMPANY

Individuals Noteworthy

(Concluded from page 46)

Visiting Professor

ERICH HELLER, Professor of German at Northwestern University since 1960, will be Carnegie Visiting Professor of Humanities at M.I.T. next fall.

Born in Czechoslovakia in 1911, he studied at Charles University in Prague and received his doctorate at Cambridge University. He has lectured at the London School of Economics, the Universities of Hamburg, Göttingen, and Bonn, and other universities, and has written extensively in both German and English on literature and intellectual history. His books include *The Disinherited Mind: Essays on Modern German Literature and Thought, The Hazard of Modern Poetry*, and *The Ironic German, a Study of Thomas Mann.*

At M.I.T. he will conduct a humanities senior seminar on "The Morality of Knowledge," and give a course on the works of Thomas Mann. His public lecture in the fall will be on Nietzsche's importance.

Faculty Notes

JOHN W. IRVINE, JR., '39, Professor of Chemistry, has received an honorary doctorate from the University of Ghent in Belgium. . . . Vice-president James McCormack, '37, has been appointed to NASA's Management Advisory Committee for Manned Space Flight. . . . Columbus O'Donnell Iselin, Professor of Oceanography, has been named a director of The Travelers Research Center, Inc. . . . Hoyt C. Hottel, '24, Professor of Fuel Engineering, has been elected to the National Academy of Sciences. . . . David N. Hume, Professor of Chemistry, has won the $1,000 Fisher Award in Analytical Chemistry. . . . Arthur L. Singer, Jr., Assistant Dean of the School of Humanities and Social Science, is joining the Carnegie Corporation staff.

Flight Forum Speakers

PANELISTS chosen to participate in the Connecticut General Flight Forum this year included Professor Emeritus Jerome C. Hunsaker, '12; Professor Raymond L. Bisplinghoff; Hall L. Hibbard, '28; and John Stack, '28.

Guggenheim Fellows

M.I.T. Faculty recipients of 1963 John Simon Guggenheim Fellowship awards, and the topics of their studies were: Assistant Professor *James G. Glimm,* nonlinear ordinary differential equations and partial differential equations; Professor *Salvador E. Luria,* biosynthic processes initiated by phage infection; Associate Professor *Harald A. T. Reiche,* anthropomorphism in Greek philosophy and early Christian theology; Professor *Alexander Rich,* mechanism of protein synthesis; Professor *Theos J. Thompson,* nuclear reactor safety; and Professor *Leon Trilling,* interaction of gas molecules with solid surfaces under conditions of very low density.

Management Speakers

PRESIDENT Julius A. Stratton, '23, of M.I.T., will speak at a plenary session of the International Management Congress in New York next September on the implications for management of the information revolution. Harold F. Smiddy, '20, will be chairman of this session. Professor Jay W. Forrester, '45, is also on the program.

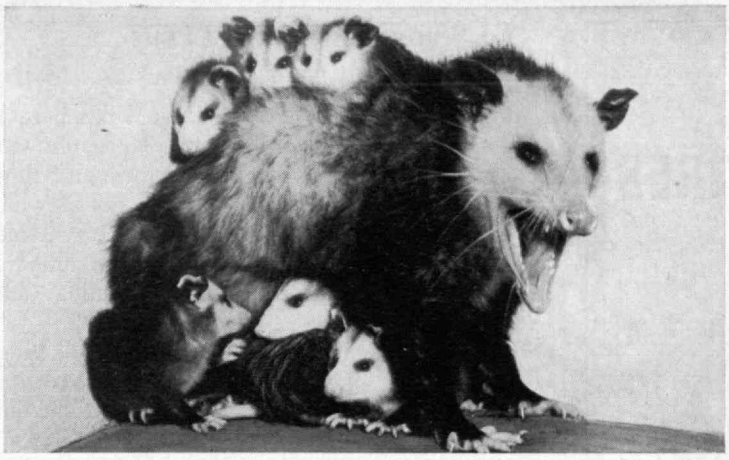


Photo courtesy of San Diego Zoo

OPOSSUMS— and something that's happening to everyone

That something is change, the major ingredient of both growth and survival. The ability to accommodate to change means survival to the opossum. He's existed more than 70 million years. Most of his early contemporaries, the dinosaur, for example, are no longer with us. Since he isn't rigid in his eating habits the opossum survived despite the disappearance of his accustomed foods. And he is equally flexible about housing. In fact, the opossum is just about the only undomesticated animal still living in the middle of New York City. He accepted change. He did not, however, utilize change. In consequence he never grew.

Unlike the opossum, the healthy man is happiest when he is growing and not merely surviving.

As a rapidly growing electronics instrument manufacturer in a highly competitive field, we at Non-Linear Systems decided to harness change to speed growth. Two years ago we discovered that the conventional management techniques used by electronic companies were stifling the enlargement of our costliest and most important resource—people. Changes effected, based upon the researched results of industrial psychology and business, have proved intriguing to many businessmen.

Typical changes included the elimination of the conventional accounting department and accomplishment of its functions at the data sources; permitting purchasing to receive, inspect, stock, schedule, and pay for material as well as buy it; replacing assembly lines with groups of five to eight persons, each of which can assemble and test the entire product; conversion of project engineers to project managers who report directly to corporate management; and assignment of mechanical designers and technicians directly to project managers. Under the new organizational setup, neither employee nor customer is more than two steps removed from the eight-man executive council which manages the company. This new structure, called "management by objectives and self-control," gives all of us an opportunity for individual development, a product essential to the survival of our free enterprise system.

Change has engendered an ever increasing productivity. A corresponding high morale and motivation is reported by social scientists in their studies of NLS.

The biggest problem experienced was not learning the new ways. It was unlearning our old ways. The unlearning process is still underway.

To Study Fast, Faint Lights

(Continued from page 30)

object moving very fast. A large S-band tracking radar aims the telescope by locating and following such a target before it has begun to glow, and thus pointing the instrument to the part of the sky at which the object's encounter with the atmosphere will make it visible. From then on the radar can be aided in guiding the main telescope by a smaller, similar telescope on the same mounting.

This auxiliary telescope has only a 12-inch mirror, but its field of view is many times as broad as that of the main instrument. The light that the smaller telescope collects is used wholly for guidance, and that collected by the mirror of the large telescope is used wholly for analysis.

The whole moving system weighs eight tons, and is driven by gearless, many-poled DC electric torque motors connected directly to the shafts. Fine aiming of the main instrument is accomplished, however, not by moving its big 48-inch mirror but by moving its smaller secondary mirror. This is a 16-inch mirror, which can be moved and adjusted more quickly and precisely than the primary 48-inch mirror. The tracking rate required in this telescope's work is about 1,000 times that needed for astronomical observations, but is attained silently and surely.

The analysis of light—which is the objective of this complex combination of things—is performed by two separate electronic spectrophotometers, both of which are attached to the large telescope and move with it.

One of these spectrophotometers receives the infrared light, with wavelengths between 0.6 and 4.0 microns, that the big mirror collects. This light is dispersed by a lithium fluoride prism and measured in 10 contiguous channels by lead sulphide cells. The output of each cell is sampled electronically at high speed, and the results are recorded on magnetic tape.

The visible and ultraviolet light, with wavelengths between 3,000 and 6,000 angstroms, that the huge mirror has collected is reflected simultaneously to the second spectrograph. In this one it is dispersed into its spectrum by a diffraction grating six inches square, ruled with 15,000 lines per inch (the largest precision grating available), and directed by an array of lenses into 30 photomultiplier tubes. Each of these tubes normally measures the light's intensity in a bandwidth of 100 angstroms. Thus the 30 channels provide continuous coverage from 3,000 to 6,000 angstroms.

By inserting masks, the bandwidth of each channel can be narrowed to 15 angstroms, and either held at some fixed point or scanned across the 100-angstrom band. Special masks can also be cut to single out particular details, such as line spectra of materials that may be present in the plasma, including ablation products from the re-entry vehicle itself.

Each photomultiplier is connected to a pulse amplifier which generates an individual pulse for every photo-electron emitted by the cathode on which the input light is focused. These pulses are fed to counters which integrate the individual photons or quanta of light received during each tenth of a second. The photo-

(Concluded on page 52)

To Study Fast, Faint Lights

(Concluded from page 51)

multipliers can be cooled to reduce internally generated noise, and the background count is only 10 quanta per second.

The quantum is the smallest unit of radiant energy, according to well-established theory, and each channel of this system is sensitive enough to measure even a few quanta of light in each tenth-of-a-second measurement period. The output pulses are counted and recorded on magnetic tape after passing through a counter that makes it possible to record signals varying over a million-to-one range.

The need for such an unprecedented instrument as this telescope was recognized in 1959, and the decision to build it was made in 1960. Major subcontractors who assisted Lincoln Laboratory in the design and construction of its components included the Reeves Instrument Corporation, the Corning Glass Works, the Perkin-Elmer Corporation, and Bausch and Lomb, Inc.

The re-entry physics research project at Lincoln has been under the general supervision of John V. Harrington, '58, Head of the laboratory's Radio Physics Division and recently appointed Director of the Institute's new Center for Space Research. Project leader and active participant has been Glen F. Pippert, leader of Lincoln's Space Physics Group. The field measurement program has been directed by Leo J. Sullivan, '40, associate leader of the Radio Propagation Group. John C. Howard is the site engineer responsible for the facilities at Arbuckle Neck, Va.

Great Expectations

(*Concluded from page 22*)

some potential). How to learn and keep on learning —this is what counts. For the scientist or engineer especially, it is not a merely desirable attribute, it is a necessity. Science *is* learning. That is its essence. And its application in new arts, new systems, new products and services—equally demands the drive and determination to learn.

It has been said a thousand times that the pace of modern technology is so fast that the education of the engineer must be continuous. This is true enough. But I think you can also turn it around and say it another way: If the drive to learn is not continuous, then the pace of technology will be neither so fast nor so productive.

Another point about education in science and engineering has been often expressed, but I can't help saying it again. I recall reading somewhere that Faraday declined to be described as a physicist. He didn't want to be classified in purely technical terms. He didn't care to be tagged as perhaps not wanting other endowments as well. He desired breadth of learning, and of being, and of understanding, as well as depth. And it seems to me that for the modern scientist or engineer, the person who is building the tools that will change the world, this is more important than ever. He will have to keep growing just to keep up with the techniques of his profession, of course—and hopefully, to advance them. But there is more besides, for his responsibility is not alone technical, it is human and it is moral.

☆ ☆ ☆

I do not want to see M.I.T. turn out this, that, or the other type, or types, of men. The need of the world is not for types, it is for individuals, each with his own integrity and his own desire to dedicate the best he can make of himself to something outside himself. I see a lot of what passes for scientific and engineering activity going on these days that somehow seems to lack the ring of silver. Maybe a contract tempts a group or an individual into short cuts. Maybe expediency dictates answers. Maybe jobs are being attemped by people not qualified to attempt them. Maybe things are being done that ought not to be done at all. This is just an impression I have and I decline to particularize. But I do have the impression and it makes me want to say to the people at M.I.T. and every institution in the land where the heritage of science and engineering is nurtured—send us, I beseech you, men who are scrupulous of their talents, who feel that something important has been entrusted to them, who prize their responsibility, who insist on being themselves and will not let themselves down.

The school that produces such men must also, it seems to me, go through a continuous process of self-renewal—examining itself, sharpening its goals, testing its methods of teaching, moving on to greater usefulness through innovation and experiment. Surely the institutions that are the seedbeds of change cannot themselves become set in their ways. Some of the evidence that M.I.T. will not do so has emerged, I think, in the venture we have been celebrating here.

Why DNA Is So Fascinating

(Continued from page 36)

10 units per hour, Magasanik demonstrated that when five A units were introduced artificially, the cells' own A-makers produced only five A units, that is, just enough to meet the quota and no more.

This mechanism, remarkable in its simplicity, appears to be a completely general one, having been discovered in almost every biosynthetic cycle studied, not only in bacteria, but in animal cells as well.

One of the more important results of DNA research has been the discovery of the mechanisms whereby viruses infect living cells. On the cellular level, the work of the viruses is relatively clear. Each virus consists simply of a nucleic acid core and an outer shell that holds it together, a protein coat. By means of the protein coat a virus is able to attach itself to the surface of a cell. (Bacterial cells are generally used in these experiments.) The virus then injects its own DNA molecule into the cell. Somehow the virus is able to bring about cessation of the cell's own messenger RNA synthesis. Then, once the messenger RNA already in action on the ribosomal particles is used up, the way is clear for the virus' own messenger RNA to take over the protein synthesis sites of the cell. In less than half an hour an invading virus is able to subvert the chemical resources of a cell to produce 200 of its own kind.

The ability of certain viruses to merge with bacterial DNA (and to re-emerge) has led Professor Salvador Luria to suggest that viruses are the basic units and viral infection may be one of the basic processes which has been responsible for the genetic patterns that have survived

(Concluded on page 58)

Dunster Shirts
Dunster Pajamas
ON SALE AT 3.49

Patronage Refund Too

Your Choice!! Big Savings!!

DUNSTER OXFORD SHIRTS—Regularly 4.20—SAVE $.71 each

Regular weight in white, blue or blue stripe with button-down collar, long sleeves and barrel cuffs.

DUNSTER BATISTE SHIRTS—Regularly 4.20—SAVE $.71 each

Light weight in white only with button-down collar and short sleeves.

DUNSTER BROADCLOTH PAJAMAS

Sizes A-B-C-D—Regularly 4.50—SAVE $1.01 each

Long Sizes B-C-D—Regularly 5.00—SAVE $1.51 each

Blue, grey or tan in coat or middy styles with piped edges.

DUNSTER BATISTE PAJAMAS—Regularly 4.25—SAVE $.76 each

Light weight in blue, grey or tan with short sleeves and knee lengths. Coat or middy styles with piped edges. Wash and wear. Sizes A-B-C-D. Jayson label.

At These Big Savings Your Purchase of 4, 6, 8 or even a dozen Shirts and/or Pajamas Is Warranted!!

THE COOP

Harvard Cooperative Society
Harvard Square
Cambridge 38, Massachusetts
TR 6-3000

MAIL ORDER FORM TR JUNE '63

SHIRTS at $3.49

Name	How Many?	Color	Neck Size	Sleeve Length

PAJAMAS at $3.49

Name	How Many?	Color	Size	Style

Name .....

Address .....

.....

☐ Check ☐ Charge Coop No.....

POSTAGE-HANDLING CHARGES: N.E. states—Free.
States east of the Mississippi—35¢ per order.
States west of the Mississippi—50¢ per order.

Why DNA Is So Fascinating

(Concluded from page 56)

in the form of life now on earth. That the evolution of mankind should be predicated upon viral infection and subsequent natural selection is not the least striking of the ideas suggested by biochemistry.

The new insights of DNA biochemistry are already being put to an extremely interesting use by M.I.T.'s Professor Joseph Altman. A psychologist, Professor Altman has injected radioactive T into animals. By an ingenious technique of subsequently exposing layers of the animal's brain to a photographic plate, Professor Altman has been able to determine that certain of the neurons in the central nervous system show radioactivity. This could only be so if the DNA of certain of the nerve cells had actually replicated by taking up the radioactive T to form half of an AT rung on the nerve cell's DNA ladder. The great interest in this is that, prior to Professor Altman's work, it had been believed that neurons in the central nervous system did not replicate. He has shown that, in fact, certain small numbers of them do.

By utilizing this technique further it may well be possible to form chemical pictures that map the chronological stages of neural development in animals. That this might give greater insight, not only into neural maturation, but into learning processes and how they affect the brain is not ruled out.

Molecular biology and its own great generalizations have brought man closer than he has ever been before to understanding the fundamental machinery of life. Having known for centuries that mighty oaks from little acorns grow, he is now on the threshold of knowing how they do it. The promise held forth by this precise knowledge of the fashion in which life propagates itself will ultimately yield greater control over disease, deformity, and even death.

It's News in "Vogue"

A FULL-PAGE portrait of Professor Claude Shannon, '40, of M.I.T. appeared in the April issue of *Vogue*, the fashion magazine. It illustrated an article entitled "The Man-Machines May Talk First to Dr. Shannon," by Brock Brower.

Trend of Affairs

(*Continued from page 26*)

The Lammot du Pont Professorship

THE FIRST fully endowed chair in M.I.T.'s Department of Chemical Engineering has been provided by a $500,000 gift from members of the family of Lammot du Pont, '01, who died in 1952 after serving for many years as president and as chairman of the board of E. I. du Pont de Nemours & Co.

"We are very proud to be able to establish a memorial professorship to Mr. Du Pont not only as a distinguished alumnus of M.I.T. but as a very great American," said Chairman James R. Killian, Jr., '26, of the Corporation. "As a member of the Institute's Corporation for nearly a quarter of a century, he contributed importantly with his wise counsel. It is most appropriate that the professorship honoring him be in the field of chemical engineering. This is a field which was founded at M.I.T., and which has long been recognized for its contributions to industry."

$400,000 for the Student Center

THE Charles Hayden Foundation contributed $400,000 this spring toward the construction of the M.I.T. Student Center on Massachusetts Avenue on which work will begin soon. This foundation, established by the late Charles Hayden, '90, to assist boys and young men, has supported scholarships since 1939 and provided funds in 1947 to establish the Charles Hayden Memorial Library on Memorial Drive.

(*Concluded on page 63*)

MELPAR'S

ENGINEERING AND RESEARCH DIVISIONS

have openings in the following fields:

Applied Mathematics • Electronics • Chemistry • Biology • Physics

Requirements include an advanced degree, and the desire to work in such areas as:

APPLIED MATHEMATICS Information Theory, Propagation Studies, Communications Privacy, Mathematical Modeling, Stochastic Processes.

ELECTRONICS Phonon Interaction, Pattern Recognition, Network Synthesis, Quantum Electronics, Random Noise Theory, Bionics, Speech Synthesis, Data Retrieval.

CHEMISTRY Molecular Spectroscopy, Low Temperature Phenomena, Gas-Solid Reactions, Gas Phase Kinetics, Gas Chromatography, Mass Spectrometry.

BIOLOGY Microbiology, Virology, Pharmacology, Biophysics, Tissue Culture.

PHYSICS Flash Photolysis, High Vacuum Technology, Energy Conversion, Monocrystalline and Thin Film Microcircuitry, Quantum Tunneling Phenomena, Infrared Detectors and Optical Systems.

MELPAR INC

A SUBSIDIARY OF THE WESTINGHOUSE AIR BRAKE COMPANY

3380 ARLINGTON BOULEVARD
FALLS CHURCH, VIRGINIA
(a suburb of Washington, D. C.)

an equal opportunity employer

For further details,
write in strictest confidence to:

John A. Haverfield, Manager
Professional Placement

PROFESSIONAL CARDS

JACKSON & MORELAND, INC.

JACKSON & MORELAND INTERNATIONAL, INC.

Engineers and Consultants

DESIGN AND SUPERVISION OF CONSTRUCTION FOR UTILITY, INDUSTRIAL AND NUCLEAR PROJECTS

ENGINEERING ANALYSES—APPRAISALS

TECHNICAL PUBLICATIONS

BOSTON WASHINGTON NEW YORK

EADIE, FREUND & CAMPBELL

Consulting Engineers

500 FIFTH AVENUE NEW YORK 36, N. Y.

Mechanical—Electrical—Sanitary
Air Conditioning—Power—Process Layouts
James K. Campbell '11

METCALF & EDDY | ENGINEERS

BOSTON • NEW YORK • PALO ALTO

THE KULJIAN CORPORATION

Engineers • Consultants • Constructors

UTILITY • INDUSTRIAL • CHEMICAL

Power Plants (Steam, Hydro, Nuclear), Public Works, Processing Plants, Oil Refineries, Textile Plants, Institutions, Highways, Expressways, Airports & Facilities, Military Installations.

H. A. KULJIAN '19 A. H. KULJIAN '48

1200 NO. BROAD ST., PHILADELPHIA 21, PA.

LOOMIS AND LOOMIS

consulting professional engineers

STRUCTURES FOUNDATIONS

WINDSOR CONNECTICUT

FABRIC RESEARCH LABORATORIES, INC.

Research, Development, and Consultation
In the Fields of Fibrous, Organic, and Related Materials

1000 Providence Highway Dedham, Mass.

(At Route 128 and U.S. 1 Interchange)

W. J. HAMBURGER, '21 K. R. FOX, '40 E. R. KASWELL, '39

SOIL TESTING SERVICES, INC.

Consulting Soil and Foundation Engineers

Site Investigations
Foundation Recommendations and Design
Laboratory Testing, Field Inspection and Control

111 Pfingsten Road Northbrook, Illinois

CLYDE N. BAKER, JR. '52 SYLVIO J. POLLICI '56

FAY, SPOFFORD & THORNDIKE, INC.

Engineers

Airports, Bridges, Express Highways
Water Supply, Sewerage and Drainage Systems
Port and Terminal Works
Industrial Plants Incinerators

Designs Investigations
Supervision of Construction

11 Beacon Street Boston, Massachusetts

CAPITOL ENGINEERING CORPORATION

Consulting Civil Engineers

DILLSBURG, PENNSYLVANIA, U.S.A.

ROBERT E. SMITH '41, *President*

MAURICE A. REIDY

Consulting Engineers

BRIDGES BUILDINGS
STRUCTURAL DESIGNS FOUNDATIONS
CONSTRUCTION CONSULTANT AND ARCHITECTURAL ENGINEER

Estimates and Appraisals

101 TREMONT STREET BOSTON, MASS.

CHARLES NELSON DEBES ASSOCIATES, INC.

Engineeers and Consultants

Structural, Electrical, Mechanical, Acoustical
Industrial, Commercial and Municipal Projects

915 EAST STATE ST. ROCKFORD, ILL.

C. N. DEBES '35

MORAN, PROCTOR, MUESER & RUTLEDGE

Consulting Engineers

Foundations for Buildings, Bridges and Dams; Tunnels, Bulkheads, Marine Structures, Soil Studies and Tests; Reports, Design and Supervision

WILLIAM H. MUESER '22 PHILIP C. RUTLEDGE '33

415 Madison Ave., New York 17, N. Y.

BREWER ENGINEERING LABORATORIES

Consulting Engineers

Electric Strain Gage Testing • Stress Analysis
Structural Model Testing • Structural Testing
Strain Gage Amplifiers • Strain Gage Switches
Ground Support Mechanism Design

MARION, MASS. TEL. 103

G. A. BREWER '38 J. D. INGHAM '43

CLEVERDON, VARNEY & PIKE

Consulting Engineers

Structural, Electrical, Civil
Heating and Ventilating, Air Conditioning, Plumbing

Design and Supervising Construction of Utility, Industrial, and Commercial Projects, Investigations, Reports, Appraisals

HERBERT S. CLEVERDON '10 WALDO F. PIKE '15
JOHN A. DOW '23 HAROLD E. PROCTOR '17

120 TREMONT STREET BOSTON 8, MASS.

Trend of Affairs

(Concluded from page 60)

The Physics of Exploration

THE FIRST national conference on "Physics of Entry into Planetary Atmospheres" will be held at M.I.T. next August 26 to 28. The American Institute of Aeronautics and Astronautics will co-sponsor it with the Institute, and Professor Ronald F. Probstein of the Department of Mechanical Engineering will be its chairman. The participants will discuss basic physical phenomena to be expected when vehicles at speeds of thousands of feet per second enter atmospheres that vary in composition and density. They will be concerned, for example, with the heating and electrical effects to be expected in descents to Mars and Venus as well as the earth. Several hundred investigators of such matters, including members of M.I.T.'s Faculty, will participate.

On Mariner Mars Fly-By in '64

HERBERT S. BRIDGE, '50, of the M.I.T. Laboratory for Nuclear Science, is one of the 10 experimenters chosen by the National Aeronautics and Space Administration for the Mariner Mars fly-by mission scheduled in 1964. The objectives will be to determine whether or not life may exist on Mars, photograph its surface, and obtain information about possible magnetic fields and trapped particle regions and possible cosmic dust close to the planet. The apparatus for which Dr. Bridge will be responsible will be a plasma probe.

The Council Considers Computers

PROFESSORS CHARLES L. MILLER, '51, and Robert M. Fano, '41, spoke at the M.I.T. Alumni Council's April meeting. Professor Miller presented a film of the "Sketchpad" computer program, and Professor Fano described Project MAC which, he explained, can signify "machine-aided cognition," "men and computers," or "multiple-access computer."

An Observation From Barnard

WHEN interviewed recently by a writer for *The Saturday Review,* Miss Rosemary Park, who is the new president of Barnard College, complained that "we don't have enough original thinking in education." Miss Park then went on to say that she gets many of her own ideas from reading in the natural sciences. "I always read the M.I.T. reports," she said. "They're just fascinating."

CHECK LIST *M.I.T. PRESS Books of the Year*

Engineering & Science

— **A Decision Structure for Teaching Machines**
By Richard D. Smallwood, Air Force Cambridge Research Laboratory.
6 x 9 *122 pp.* *$4.00*

— **Ice and Snow:** Properties, Processes, and Applications
Edited by W. David Kingery, Director, Ice Research Laboratory, M.I.T.
6 x 9 *684 pp., illus.* *$16.00*

— **Impact Phenomena in Textiles**
By W. James Lyons, Associate Research Director, Textile Research Institute.
6 x 9¼ *192 pp.* *$6.00*

— **Magnetohydrodynamic Shock Waves**
By J. Edward Anderson, Minneapolis-Honeywell and University of Minnesota.
6 x 9¼ *226 pp.* *$6.50*

— **Synthesis of Optimum Nonlinear Control Systems**
By Harry L. Van Trees, Assistant Professor of Electrical Engineering, M.I.T.
6 x 9¼ *102 pp.* *$4.00*

— **Varactor Applications**
By Paul Penfield, Jr. and Robert P. Rafuse, Assistant Professors of Electrical Engineering, M.I.T.
6 x 9¼ *623 pp.* *$15.00*

— **Waves in Anisotropic Plasmas**
By William P. Allis, Professor of Physics, M.I.T.; Solomon J. Buchsbaum, Head, Solid State and Plasma Physics Research, Bell Telephone Laboratories; and Abraham Bers, Assistant Professor of Electrical Communications, M.I.T.
6 x 9 *280 pp.* *$7.50*

Economics

— **The Communist Foreign Trade System**
By Frederic L. Pryor, Assistant Professor of Economics, University of Michigan.
5 x 8½ *304 pp.* *$7.50*

— **Domestic Airline Efficiency:** An Application of Linear Programming
By Ronald E. Miller, Assistant Professor, Regional Science, University of Pennsylvania.
6 x 9 *178 pp.* *$6.00*

— **The Natural Resource Content of U.S. Foreign Trade, 1870-1955**
By Jaroslav Vanek, Assistant Professor of Economics, Harvard University.
6 x 9 *160 pp.* *$4.00*

Planning

— **A Communications Theory of Urban Growth**
By Richard L. Meier, Associate Professor, Resources Planning, University of Michigan.
6 x 9¼ *192 pp.* *$4.50*

— **The View From the Road**
By Donald S. Appleyard, Assistant Professor of Urban Design, M.I.T.; Kevin Lynch, Associate Professor of City Planning, M.I.T.; and John R. Myer, Assistant Professor of Architecture, M.I.T.
9½ x 15 *64 pp., illus.* *$4.95*

Political Science

— **Albania and the Sino-Soviet Rift**
By William E. Griffith, Research Associate, M.I.T. Center for International Studies.
6 x 9¼ *423 pp.* *$7.95*
Paper, $2.95

— **Community and Contention:** Britain and America in the 20th Century
By Bruce M. Russett, Assistant Professor of Political Science, Yale University.
6 x 9 *252 pp.* *$7.00*

Other Fields

— **Communication:** A Logical Model
By David Harrah, Assistant Professor of Philosophy, University of California (Riverside).
6 x 9¼ *118 pp.* *$4.00*

— **Conflict and Conformity:** A Probability Model and Its Application
By Bernard P. Cohen, Associate Professor of Sociology, Stanford University.
6 x 9¼ *208 pp.* *$5.00*

— **Experiencing Architecture** (2nd Edition)
By Steen Eiler Rasmussen, Professor of Architecture, Royal Academy of Fine Arts, Copenhagen
6 x 9¼ *245 pp., illus.* *$7.95*

— **Universals of Language**
Edited by Joseph H. Greenberg, Professor of Anthropology, Stanford University.
6 x 9¼ *269 pp.* *$6.00*

Send me the books I have checked above.
I may return in 10 days any books which I do not find useful, for full refund.

I enclose my check for $.....

NAME _____

ADDRESS _____

CITY _____ STATE _____

THE M.I.T. PRESS **238 MAIN STREET, CAMBRIDGE 42, MASSACHUSETTS**

Club News

M.I.T. Club of France Elects Celler to Presidency

The M.I.T. Club of France had a luncheon meeting at La Reine Pédauque to welcome Lawrence J. Heidt, Professor of Chemistry, en route to Cambridge after several months fellowship in Japan. We also had the pleasure of having with us and hearing a short talk by William P. Allis, '23, Professor of Physics, on leave in Paris as Chief Scientific Advisor to NATO.

It was a particular pleasure to have with us our dear friend and Honorary President, Welles Bosworth, '89, long time resident in France and the architect who designed and built the original M.I.T. complex in Cambridge. Welles is in his 94th year and honorary citizen of the city of Versailles, Reims, Fontainebleau, and Vaucresson—a distinction which even no Frenchman enjoys in this country.

This luncheon meeting was extremely pleasant and was the last to be led by our outgoing President, Frederick E. Walch, '26. A slate of new officers, unanimously voted in for the next two years, included: Frédéric A. Celler, '29, President; Francoise L. Giraud, '48, Vice-president; Louis P. Bodmer, '57, Secretary-Treasurer; and Claude B. Robert, '54, Assistant Secretary-Treasurer—and, of course, Welles Bosworth, '89, as Honorary President.—Louis P. Bodmer, '57, Secretary, 32 Rue St. James, Neuilly S/ Seine, France.

Long Island Alumni Elect 1963-1964 Officers

Over 50 members, wives, and friends of the M.I.T. Club of Long Island enjoyed a social gathering on March 22 at the Wheatley Hills Tavern in Westbury. Entertainment consisted of dinner and dancing to recorded music. Prizes were awarded for dancing skills. Doug Tooley, '28, and Ollie Hoag, '35, were chairmen.

Myron A. Cantor, '39, has resigned as Club President because of relocation to the West Coast. Newly elected officers are: Duane Yorke, '54, President; John Sherman, '31, Vice-president; Douglas A. Tooley, '28, Secretary; and Steven E. Eppner, '45, and Robert I. Kraus, '42, members of the Board of Directors.

On June 15, the club members and their families will wind up this season's events with a delightful boat trip around Manhattan Island. The chairmen are Hugo Wikstrom, '50, and Warren Obes, '49. Interested Long Island Alumni can obtain further information through the M.I.T. Club of New York or by contacting Duane Yorke, '54, President, 112 Clover Drive, Massapequa Park, L. I.—Jimmie Chin, '56, Secretary, 67-15 152nd Street, Flushing 67, N.Y.

Northern Californians Greet President and Mrs. Stratton

The M.I.T. Club of Northern California was co-host with the World Affairs Council on April 10 to President Julius A. Stratton, '23, and Mrs. Stratton, and to Mrs. Stratton's brother-in-law and sister, Mr. and Mrs. Gerrit S. Henry. This, the second joint meeting of the Club and the Council, was a dinner meeting at the Fairmont Hotel in San Francisco attended by over 100 guests.

Dr. Stratton had some interesting points to make on little appreciated problems on the emerging nations. He has found that one of the basic difficulties arises from the lack of a history or tradition of self-government to draw on in these nations. The United States, by contrast, in the same position, had 2,000 years of English and Western European history on which to pattern itself. The lack of individuals capable of running a government, or even capable of minor administrative positions, is severe.

President Stratton went on to discuss his visit to India and some of the political and economic problems the Indians are encountering. He commented that the recent attacks by the Chinese may have alerted the Indian people to a realization of their military and governmental shortcomings. Dr. Stratton also discussed India's numerous educational institutions and their difficulties in obtaining adequate faculties. These problems have given rise to an unusually large number of Indian applications for study in the United States.

Dr. Stratton was introduced by Mortimer Fleischhacker, President of the World Affairs Council. Gaynor H. Langsdorf, '32, regional chairman of the Second Century Fund, and Lionel S. Galstaun, '34, Club President, also spoke briefly.

Prior to the dinner meeting, Dr. Stratton and several Bay Area business leaders were entertained by a small group of Alumni at a luncheon in the Bohemian Club. Guests were S. D. Bechtel, Chairman of the Board, Bechtel Corporation; O. N. Miller, President, Standard Oil Company of California; W. E. Rhoades, Vice-president, United Air Lines; and H. J. Walker, Vice-president, Southern Pacific Company. Club members present were: Rogers S. Borovoy, '56, George W. Burgess, '29, Alfred E. Castle, '40, W. Kenneth Davis, '40, Lionel S. Galstaun, '34, H. Royce Greatwood, '24, Rockwell Hereford, '24, William R. Hewlett, '36, George M. Keller, Jr., '48, Gaynor H. Langsdorf, '32, Decker G. McAllister, '21, William D. McGuigan, '42, Denman K. McNear, '48, Clifford E. Moffet, '41, Norman H. Moore, '41, Frederick F. Noonan, '40, Robert N. Noyce, '53, Richart T. Perry, '25, Leslie N. Reynolds, '55, John D. Rittenhouse, '40, and Bert O. Summers, '34.

Mrs. Stratton and Mrs. Henry were the guests of the wives of the Club officers, headed by Mrs. H. Royce Greatwood and Mrs. Rogers S. Borovoy, at a luncheon at the Canterbury Hotel.—Roger S. Borovoy, '56, Secretary-Treasuer, Lippincott, Ralls & Hendrickson, 535 Middlefield Road, Room 8, Palo Alto, Calif.

Central Pennsylvania Club Hears M.I.T. Concert Band

The M.I.T. Concert Band under the direction of John Corley visited Cedar Cliff High School in the Greater Harrisburg area on February 1. An afternoon concert was given for the faculty and staff of the high school and an evening concert was presented for the public—including many members of the M.I.T. Club of Central Pennsylvania. Selections included "Symphonic March, Op. 80," by Alexander Tcherepnin; "Symphony (No. III) for Winds and Percussion," by Thomas Beversdorf; "Concerto Grosso," by Peter Seeger, and "Symphony No. III for Band," by Vittorio Giannini.

Recently elected officers for 1963-1964 were: Robert E. Smith, '41, President; Karl E. Katz, '50, First Vice-president; and Charles W. Richards, '21, Second Vice-president. A business-social meeting was held on April 7 at the home of Marshall M. Holcombe, '36, for members of the Educational Council and out-going and in-coming club officers to discuss Alumni matters.—Robert K. Peterson, '48, Secretary, 566 Brentwater Road, Camp Hill, Pa.

Central Massachusetts Club Meets With Harvard Group

A joint meeting of the Harvard Business School Club of Worcester and the M.I.T. Club of Central Massachusetts on March 7 at the Stockholm Restaurant, Worcester Municipal Airport, was attended by approximately 50 alumni from both schools.

Jay W. Forrester, '45, Professor of Industrial Management at M.I.T. and the former head of the Digital Computer Division of Lincoln Laboratory, discussed "Significant Elements in the Growth of an Enterprise"—a subject of equal interest to both Harvard Business School and M.I.T. Alumni. Through the use of charts and graphs, Dr. Forrester explained the aspects of management and production and their related functions which can be fairly well predicted.

The last meeting of the year was to be a "Ladies' Night" on Sunday, May 5, at which time club members, friends, and their ladies planned a dinner meeting at Ken's Steak House on Route 9 in Framingham, followed by M.I.T. Night at the Boston Pops at Symphony Hall.—Arnold A. Kramer, '52, Secretary, 88 Longfellow Road, Worcester 2, Mass.

Boston Stein Members Consider Acoustics

Leo L. Beranek, Lecturer in Electrical Engineering at M.I.T. and an associate of the consulting firm of Bolt, Beranek, and Newman, was to address the Boston Stein Club on April 29 at Valle's in Chestnut Hill. Dr. Beranek has circled the globe to study the musical and acoustical properties of the world's great concert halls. This research eminently fitted him for his role as acoustical consultant in the design of America's newest temple of the performing arts, Lincoln Center.—Dr. Arthur Miller, '34, President, 91 Walnut Hill Road, Brookline, Mass.

Southern California Club Entertains M.I.T. Guests

The M.I.T. Club of Southern California was honored in April by a visit of President Julius A. Stratton, '23, and Mrs. Stratton to Los Angeles. The Club held a reception on April 11 in the Pacific Ballroom of the Statler-Hilton Hotel in Los Angeles. Over 300 Alumni and their wives attended the reception and dance.

Prior to the reception, the officers and governors of the Club, along with Alumni Fund representatives and members of the Educational Council in Southern California and distinguished guests, feted Dr. and Mrs. Stratton at a dinner. Among those attending were: General James H. Doolittle, '24, and Mrs. Doolittle; Ivan Getting, '33, and Mrs. Getting; President Lee DuBridge of Caltech, and Mrs. DuBridge; and Albert G. Hill, Professor of Physics at M.I.T., presently at Caltech, and Mrs. Hill.

Also present were: Mr. and Mrs. Sam Lunden, '21, Mr. and Mrs. Harold Strauss, '38, Mr. and Mrs. Richard DeWolfe, '36, Mr. and Mrs. Phil Bates, '24, Mr. and Mrs. Bill Sample, '34, Mr. and Mrs. Martin Chetron, '56, Mr. and Mrs. Richard Steele, '46, Mr. and Mrs. Robert Copsey, '44, Mr. and Mrs. Victor Stanley, '44, Mr. and Mrs. John Barriger, '49, Mr. and Mrs. William Hawe, '52, Mr. and Mrs. Ray Wyland, '42, Mr. and Mrs. Albert Levingston, '49, Mr. and Mrs. Ed Schumann, '57, Mr. and Mrs. Arthur Schwartz, '47; Hiram Beebe, '10, Richard Hutzler, '40, Richard Singer, '53, George Bond, '57, Joseph Skenderian, '61, T. Gary Loomis, '44, and Robert Welles, '15.—Arthur Schwartz, '47, Secretary, 8355 Blackburn Avenue, Los Angeles 48; Robbins H. Ritter, '37, Assistant Secretary, 4011 Goodland Avenue, Studio City, Calif.

Boston Alumni Elect Macomber to Presidency

The M.I.T. Club of Boston elected officers for 1963-1964 at a luncheon on April 11 at the Union Oyster House. They are: George Macomber, '48, President; Warren W. Heimbach, '58, Vice-president; John M. Reed, '57, Secretary-Treasurer; and Helge Holst, '31, Robert C. Cowen, '49, Bruce B. Bredehoft, '56, Vincent T. Estabrook, '36, and Russell N. Cox, '49, as members of the Executive Committee. The nominating committee included Charles Hieken, '51, Chenery Salmon, '26, and William Edgerly, '49.

General James McCormack, '37, a Vice-President of M.I.T., spoke on "Role of Non-Profit Research Organizations." These vital but controversial operations have been making considerable news in Washington and elsewhere this past year —and M.I.T. has played a major role in our defense effort through some of these organizations. General McCormack, as a past Director of Research and Development for the Air Force and past Director of Military Applications for the AEC, was particularly qualified to speak on this timely subject.—Russell N. Cox, '49, President, 103 Loring Road, Weston; Warren W. Heimbach, '58, Vice-president, 120 Sylvan Street, Danvers, Mass.

Where M.I.T. Classes Meet This Month

1898: June 7-10, Burton House, M.I.T.
Reunion Chairman: Edward S. Chapin

1903: June 7-9, Burton House, M.I.T.
Reunion Chairman: John J. A. Nolan

1908: June 7-9, Melrose Inn, Harwichport
Reunion Chairman: H. Leston Carter

1913: June 7-9, Oyster Harbors Club, Osterville
Reunion Chairman: George P. Capen

1915: June 10, 4 P.M., Class Cocktail Party
Chairmen: Albert E. Sampson and Barbara Thomas

1916: June 7-9, Oyster Harbors Club, Osterville
Reunion Chairman: Ralph A. Fletcher

1917: June 7-9, Publick House, Sturbridge
Reunion Chairman: Henry E. Strout

1918: June 7-9, Wianno Club, Osterville
Reunion Chairman: Alan B. Sanger

1923: June 7-9, Chatham Bars Inn, Chatham
Reunion Chairman: Howard F. Russell

1928: June 7-9, Wychmere Harbor Club, Harwichport
Reunion Chairman: Arthur A. Nichols

1933: June 7-9, The Nautilus Motel, Woods Hole
Reunion Chairman: Edward S. Goodridge

1938: June 8-10, Everett Moore Baker House, M.I.T.
Reunion Chairman: Albert O. Wilson, Jr.

1943: June 7-9, Mayflower Hotel, Plymouth
Reunion Chairman: Kenneth L. Warden, Jr.

1948: June 7-9, The Belmont, Harwich, Mass.
Reunion Chairman: Kenneth S. Brock

1949: June 10, 4:30-6:15 P.M., M.I.T. Faculty Club
Chairman: George H. R. McQueen

1953: June 7-9, Chatham Bars Inn, Chatham
Reunion Chairman: Paul P. Shepherd

1958: June 7-9, Charter House Motor Inn, Cambridge
Reunion Chairman: Cornelius Peterson

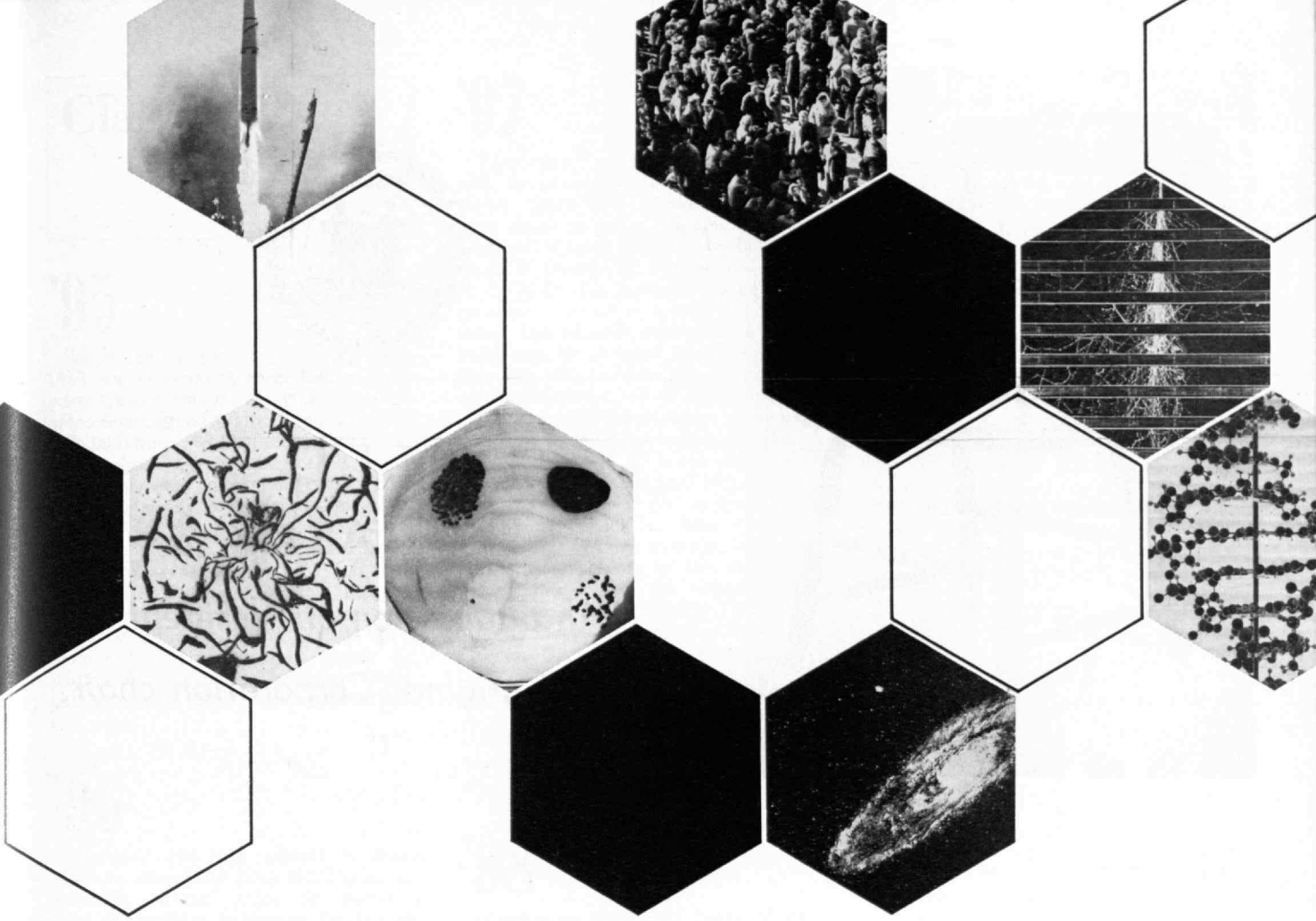
1958: June 15-16, Sheraton-Plaza Hotel, San Francisco
Regional Co-Chairmen: Lewis H. Cohen and Mrs. Antonia D. Schuman

Mexico City Alumni Present 15th Annual M.I.T. Fiesta

The 15th Annual M.I.T. Fiesta in Mexico City took place March 7-9 with between 40 and 50 Alumni present—at least half of them visitors to Mexico. A luncheon at the University Club marked the opening of the Fiesta. Alvino Manzanilla, '31, President of the M.I.T. Club of Mexico, greeted the Alumni. They were also welcomed by C. M. Cornish, '24.

The following day was spent in a visit to the home of President Manzanilla to view his collections and in a tour of the Art Trade Exhibition and Fair, where arts and handicraft exhibits from all sections of Mexico were gathered. Many of the articles on display were also being made in the various booths. It was a most impressive exhibit including everything made in Mexico from soap to sewing machines, as well as handicraft items. An exhibition of folk dances and ballet was part of the Fair and portrayed the history of Mexico from the days of the Aztecs to the present.

The Fiesta concluded with an exciting "Noche Mexicana" held on the estate of "Nish" Cornish. His large yard was decorated and set up with seven or eight food booths, each cooking a special Mexican delicacy. The Alumni spent the entire evening out under the trees being entertained by a marimba trio and dancers. Most of the Mexicans attending were wearing colorful folk costumes.



The Massachusetts Institute of Technology Alumni Seminars

In the belief that many M.I.T. Alumni and their wives would welcome the opportunity to learn about exciting knowledge now developing at M.I.T., a special three-day seminar will be offered on September 7, 8 and 9, 1963. It will be held on the M.I.T. campus for a group of 150 to 250 Alumni and their wives.

The general theme, "The Beginnings of Things," will be divided into a series of lectures followed by discussion periods with the lecturers and their colleagues. Prior preparation from reading lists will be assigned. The lecturers and their topics are as follows:

The Origin of Matter

Harlow Shapley, Paine Professor of Practical Astronomy, Harvard, and Life Member, M.I.T. Corporation; **Patrick M. Hurley, '40,** Professor of Geology; and **William S. von Arx, '55,** Professor of Oceanography.

The Origin of Life

Irwin W. Sizer, Professor of Biochemistry and Head of the Department of Biology; **John M. Buchanan,** Professor of Biochemistry; and **Francis O. Schmitt,** Institute Professor and Professor of Biology.

The Shaping of Modern Society

Cyril S. Smith, '26, Institute Professor and Professor of Humanities and Metallurgy; **Warren K. Lewis, '05,** Professor Emeritus of Chemical Engineering; and **Vannevar Bush, '16,** Honorary Chairman of the M.I.T. Corporation.

At the end of the three days there will be a panel discussion by **Vannevar Bush, '16, Warren K. Lewis, '05, Elting E. Morison,** Professor of Industrial History, **Cyril S. Smith, '26,** and **Norbert Wiener,** Institute Professor and Professor of Mathematics, Emeritus. Concluding remarks will be made by **George R. Harrison,** Dean of Science.

Housing and meals will be on the M.I.T. campus. The fee for the seminars will be approximately $50.00 per person including room, board, and advance reading material. Those who want to assure receipt of further information and registration material should return the form below promptly. Attendance will necessarily be limited. Registration material will be sent in June, 1963.

Committee on Continuing Education
M.I.T. Alumni Association
Room 1-280, M.I.T.
Cambridge 39, Massachusetts

Please send me further information and registration materials for the M.I.T. Alumni Seminars planned for September 7, 8 and 9, 1963.

Please Print

Name _____

M.I.T. Class _____

Address _____

M.I.T. CHAIR

An adaptation of President Rogers' original Corporation chair

Its style **will fit all homes—in libraries, studios, dens, living rooms.**

Its dignity **will add to offices and reception rooms.**

Its exclusive design **is available only through the M.I.T. Alumni Association.**

This beautiful black and gold chair, adapted from the traditional Corporation chair of President Rogers, is now made available to all Alumni. Orders are being taken by your Alumni Association at a price of only $32.50 each, F.O.B. Gardner, Mass. Each chair is packed in its own heavy carton to insure safe transit.

Class News

'95

More than a year ago, on April 10, 1962, our classmate **George Linder Bixby** passed away leaving his wife, five children, seven grandchildren, and six great-grandchildren. We have never been consulted about any member of his family being interested in coming to M.I.T. If now or later any descendant of any member of M.I.T., '95, becomes interested, we hope to be advised in order to assist financially by reason of the provision made by our 50-Year Fund for that purpose. . . . Come to lunch and our class meeting under the tent on the Charles River Memorial Drive, Monday, June 10, Alumni Day.—**Andrew D. Fuller,** Assistant Secretary, 120 Tremont Street, Boston, Mass.

'96

There is still time enough to make plans to attend the class meeting at the luncheon Alumni Day, on Monday, June 10 and listen to Provost Townes tell about the 10-year-old maser. . . . The Review reported the birthdays of 90-year olds in April; **Walter J. Mayo** made it on the 18th. When the great-grandfathers are listed **Henry Hedge** will be included.

Your class secretary did not contribute this note but some of our other M.I.T. Alumni skating enthusiasts send word of seeing our **Jim Driscoll** skating well at the Skating Club of Boston rink, along with some of his children and grandchildren. Jim no longer does figures, but in younger days he did the various dances and cut good edges. Figure skating is a family sport with the Driscolls; son Michael, '41, skated in many competitions.

Mrs. **Hattie Gates Campbell,** who died April 8, was the oldest Tech alumna. There were four M.I.T. men at the funeral service. For years she taught science at the South Boston High School, and her membership in many clubs and associations was an indication of her broad interests. Reverend Frederick M. Meek conducted the funeral service at the Old South Church where Mrs. Campbell was a member of the Women's Guild. The pastor spoke of her devotion and help to his church and to the Union Church before it joined with the Old South. In his tribute he characterized teachers as unsung heroines who exercise a most helpful influence on the youth of the nation. There are now 37 members in the class.—**James M. Driscoll,** Secretary, 129 Walnut Street, Brookline, Mass.; **Henry R. Hedge,** Assistant Secretary, 105 Rockwood Street, Brookline, Mass.

'97

These notes were originally drafted with the statement that "no news" received meant only "good news," when there came to me a clipping from the Hartford, (Conn.) Courant, telling of the death of **George H. Knight,** 88, Course II, on April 1 in Torrington, Conn. I remember him well as a most able, industrious and likeable classmate. I do not know that he attended any of our reunions. His wife survives him, as well as a son, 6 daughters, 23 grandchildren and 27 great-grandchildren. I am sending the sympathy of the class to Mrs. Knight.

To indicate that '97 is not wholly obsolete, it has been suggested that we interest Tech men "over 65" in the sport of Tiddlywinks, which has none of the bad heart effects of lawn mowing, snow shovelling or golf. More on this subject another time. . . . In the meantime, who expects to be at Cambridge June 10 for Alumni Day? The good work of Edward Chapin, '98, appears to have gathered quite a crowd for the 65th Reunion of '98, making our one representative last year, **Will Binley,** seem a rather feeble attempt.—**George R. Wadleigh,** Acting Secretary, 70 Flower Avenue, Hastings-on-Hudson, N.Y.

'98

Continuing the Class News of May, wherein we endeavored to straighten out the complications caused by the passing of our active president, **Daniel W. Edgerly,** we will just quote the last paragraph of the notes for May, 1963, and then bring matters up to date: "Obituary notices about Leroy H. Byam, John E. Warren, Edgar W. Norton and various other matters of general interest, will appear in later issues of the Technology Review. Now it is a question of 'All together for the 65th Reunion of the Class of '98, next June.'" With regard to the passing of **Leroy H. Byam,** we append a letter from his grandson, Peter Banner to D. Reid Weedon, Jr., '41, Chairman of the Alumni Fund Board Committee, which Mr. Weedon has kindly forwarded to us: "Dear Mr. Weedon: I am sorry to inform you that Mr. Leroy Byam, who graduated from M.I.T., Class of 1898, died on June 17, 1962. Due to the confusion of cleaning up his estate you were not informed earlier. My grandfather always had a warm spot in his heart for M.I.T. and was glad to receive the Newsletters and alumni information. Although I regret having to inform you of his passing it is comforting to know he had a rich full life. After graduation he worked with the New York Central Railroad until he went into partnership with the Elliot C. Brown Company, which constructed luxurious homes. The partnership was dissolved in the early 1940's due to building costs. During the war he worked as an engineer for the J. G. White Company until his retirement in 1943. All during his life he was a very active yachtsman, having many goodsized sailboats, and when the autumn of his life came he turned to power boats. He knew the New England waters and Long Island Sound like the palm of his hand and always had many interesting stories to relate. Very truly yours, Peter Banner." Classmates will remember that we had hoped at the 65th Reunion that our two active yachtsmen, Leroy H. Byam and **Lyman F. Hewins** would pull off for our edification some nautical stunts.

With regard to **John E. Warren,** we have received a wonderful letter from his cousin, Mrs. Elizabeth Hayward (wife of Sumner Hayward, '21, M.I.T.) which we are including in the notes: "Dear Mr. Chapin: Your classmate and my cousin, John E. Warren, has just died. I will give you a fairly full account of his life, trusting you to use your judgment in adapting it for use in your column in The Technology Review. John E. Warren was born in Foxboro, Mass., May 26, 1874. He was the son of Samuel and Sarah (Akin) Warren and a great-great-nephew of General Joseph Warren of Bunker Hill. After graduating from M.I.T. in 1898 as a mechanical engineer, John accepted a position with the Chicago Great Western Railroad. He worked in Oelwein, Iowa, as well as in St. Paul and Chicago. In September, 1899, John resigned and returned East. He became chief draftsman in the office of a Boston consulting engineer, remaining there for 14 years. He then became a sales engineer for the American Radiator Company, leaving 13 years later to open his own office as a consulting engineer. This office he maintained until he retired. Throughout his active life John's home was in Foxboro, but after the death of his wife, Caroline, in 1953, he moved to Columbia, Conn., to the home of his daughter Mary (Mrs. Wilbur C. Fletcher). There, while his health steadily failed and he lost his eyesight, he was most affectionately cared for by the Fletcher family. A few months ago it became necessary for him to enter a nursing home, and it was there that he died January 17,

Senior Executive Alumni Move to New Posts

Thomas S. O'Brien, Spring '58, has been appointed Manager of Socony Mobil Oil's East Audit Department. . . . **Louis E. Dequine, Spring '60,** is now Executive Director, Nylon, for the Chemstrand Company in New York. . . . **Cecil P. Dotson, Spring '59,** has been named Vice-president, Semiconductor-Components Division, Texas Instruments, Inc., Dallas, Texas. . . . **Elmer J. Carter, Spring '58,** has retired from his position as Senior Vice-president of Semet-Solway Division of Allied Chemical Corporation and is now practicing law in Fort Lauderdale, Fla. . . . **William M. Langerman, Spring '59,** is now Branch Manager, Natal and Border, for Mobil Oil of Southern Africa (Pty) Ltd., in Durban, South Africa. **Robert R. White Fall, '60,** has been appointed special assistant to the president of Champion Papers, Inc., in Hamilton, Ohio.

1963. 'When am I going back to Foxboro?' he asked his daughter one day just before his life ended. It was in Foxboro that he was buried, after funeral rites at St. Mark's Episcopal Church there. Survivors in addition to Mrs. Fletcher are his son, Joseph, the actor, five grandsons and two granddaughters. One of his grandsons, Steven J. Fletcher, is a member of the present sophomore class at M.I.T. John attended 1898's 25th Reunion dinner, so he wrote me in 1960, adding: 'I had a wonderful time.' And in 1948 he was with those of you who celebrated your 50th Reunion. Generous himself, he was a man who appreciated generosity in others, so I am confident that the pleasure it gave him to be with you on these two special occasions was truly appreciated. Sincerely yours, Elizabeth Hayward." Thanks, Mrs. Hayward, for this very full biography of your cousin and our classmate, John E. Warren. When the secretary lived in Sharon, Mass., and John in Foxboro, we frequently met and enjoyed talking together.

With regard to **Edgar W. Norton** of Shrewsbury, Mass., we have no extra information except the notice from the M.I.T. Alumni Register that he died on September 4, 1962. The same remarks apply to **Arthur W. Franklin** of Indianapolis, Ind., who passed on March 21, 1963. It will be remembered that Arthur sent us greetings and several interesting and pertinent poems on the occasion of various previous reunions, which he was unable to attend because of sickness. It is possible that in later issues of The Technology Review we may be able to supply details about their careers.

We have a new address for **Edward T. Foulkes,** from 421 15th Street, Oakland 12, Calif., undoubtedly his address as a practising architect, to 1768 Leinert Boulevard, Oakland 1, Calif. We noted with pleasure that about a year ago, on April 9, 1962, Ed replied to Dan's letter #27, that there is a probability that he may come to the 65th Reunion of the class. This would be wonderful, Ed, for many of your classmates of '98, especially the Course IV members, would like to see you, from far California to talk over times, old and new and intermediate. . . . It so happens that '98 is fortunate in having friends in other classes who can furnish us with interesting details concerning our classmates. Thus, in January, 1963, the active secretary, Harold F. Dodge, '16, sent to our assistant secretary, Fred A. Jones, an interesting letter describing a call by a classmate, Ed Weissbach, '16, on a classmate of ours, Professor **Joe Riley.** . . . And now we also have the pleasure of including in these June notes a clipping sent to us by Norman E. Seavey, '99, from Orlando, Fla., concerning our classmate, **Roger W. Babson.** The story briefly is as follows: "Who am I who sends this? I am a member of '99, Norman E. Seavey. My best friend in you class was **Elliot Barker.** May your anniversary be very successful. Cordially yours, Norman E. Seavey." The clipping sent to us by Norman E. Seavey, '99, is from the Orlando (Fla.) Sentinel, issue of March 18, 1963. At the top of the clipping is a good picture of our classmate, Roger W. Babson, clothed in white, and cutting a cake for many eager boys and girls. We quote as follows: "Roger W. Babson Cuts Cake as Pine Hills youngsters await treat. Namesake of road has big time. 'Kids, Land' Best Investment, Babson tells Tea Party here. By Dennis Friel. 'The best investments are kids and land', advised financial wizard Roger Babson yesterday at a lawn party given him by residents of a Pine Hills road bearing the famed columnist's name. Babson, whose weekly business report has appeared in The Sentinel for many years, went on to predict that President Kennedy's tax cut program will be passed by Congress and '1964 will be a boom year.' He warned that 'with labor putting us on the spot, and Common Market competition becoming stronger, the U. S. will have to be on its toes or become accustomed to skim milk instead of cream.' In regard to the Orlando and Central Florida area, the 88-year-old business virtuoso applauded its development and stated, 'It was brains that built Orlando. We had no great harbor to promote shipping or natural resources such as the phosphates to be found in other sections of Florida, but we had brains that brought in the Martin Company and others like it. The future of Orlando lies in the electronics industry.' He brought cheers and applause from the cookie and cake laden guests when he stated 'Orlando ought to be the capitol of Florida.' They further approved his stories of Florida in 'the good old days' when horses and boats were the chief transportation and land was to be had for $3.50 an acre. The party held on the front lawns of Mr. and Mrs. Edward Sincic and Mr. and Mrs. Curtis Friel of 1514 and 1508 Roger Babson Road, was the result of a chain of events which began with Sincic and a group of associates attending a seminar at Webber College, Lake Wales, which was founded by Babson and his wife.

"The group visited the financier and found him in bed recovering from a slight heart attack but willing and able to receive guests. In the course of conversation it was mentioned Sincic resided on Roger Babson Road in Orlando and Babson, who has had towns, buildings, and colleges named after him, showed considerable interest. The following day Babson telephoned the Sincics and was consequently invited by Mrs. Sincic to visit here some Sunday afternoon. It was later arranged that yesterday would be convenient and the entire neighborhood of about 30 families pooled their tables, chairs, pastries and punch to honor their street's namesake. Most certainly this elder statesman of American business has been honored at more gala affairs, but it would be difficult to imagine him enjoying one more than yesterday's simple but poignant 'tea party.' "—**Edward S. Chapin,** Secretary, 271 Dartmouth Street, Boston 16, Mass.; **Frederic A. Jones,** Assistant Secretary, 286 Chestnut Hill Avenue, Brighton 35, Mass.

Happy Birthday

Congratulations are extended during June to four, six and thirteen Alumni, who will celebrate, respectively, their 90th, 85th and 80th birthdays this month, as listed below with dates of birth:

June, 1873—ROBERT A. DAVIS, '96, on the 18th; ALBERT H. SPAHR, '96, on the 19th; THOMAS H. WIGGIN, '95, on the 20th; and HOWARD A. NOBLE, '97, on the 22nd.

June, 1878—FRANK K. MITCHELL, '02, on the 3rd; HORACE W. OXNARD, '00, on the 4th; EARL B. CRANE, '02, on the 12th; LEWIS B. ABBOTT, '99, on the 27th; EMANUEL GORFINKLE, '02, on the 29th; and PERCY R. ZIEGLER, '00, on the 30th.

June, 1883—PHILIP J. GARRIGAN, '06, on the 1st; CARROLL A. SUTHERLAND, '10, on the 2nd; FREDERIC G. COBURN, '07, on the 14th; WILLIAM D. MILNE, '08, on the 16th; SAMUEL M. SCHMIDT, '11, on the 18th; WALTER B. WYMAN, '06, on the 19th; ROWLAND B. ANTHONY, '08, on the 22nd; HARRY B. CHAPIN, '04, on the 23rd; HARRY H. BENTLEY, '08, on the 24th; MARTIN J. FOLEY, '06, on the 25th; S. ATMORE CAINE, '05, and ANTHONY P. MATHESIUS, '06, on the 26th; and WALDRON G. LAWRENCE, '06, on the 30th.

'00

Harry Morris writes from Washington, D.C., as follows: "I am burdening you with my answer to your Christmas inquiry because I have hurriedly gone over the Class News accumulating since I left (for California last December) and find too many notices of 'dead ones' and but few accounts of lively ones, in which class I can still qualify, even with only one partially useful eye. I was 87 the first of November, having been born right here when it was a pleasant country town which has long ago outgrown any semblance to an agreeable place to live in unless you are young and politically motivated. However, because I joined a couple of the best clubs when it was easy and inexpensive, I have a 'second' home as they say a men's club should be. The most famous of these is the Cosmos Club which I use constantly and associate with a group of younger engineers, one of whom, Arthur Sherman, lives in this huge caravansary called The Westchester, and with the bunch share martinis and lunch and play cowboy pool in spite of having only one partially good eye and aged hearing. I have finished and privately printed another little book on some of my mining experiences with pictures that **Dan Johnson** and I took 50 years ago, principally in Nevada; and I am now trying to get rid of 300 copies—the whole issue—at a fraction of the cost, as I have no agent. In 1960 my wife and I went to California for several weeks to see her sister in the south and have a look at dear, old San Francisco where Etheredge Walker, '99, was very nice to us and had us to dinner at his long-time abode, the Palace Hotel. Then he gave me a card to the famous Bohemian Club as they were gathering to go up to the Grove for the annual high jinks and I shook hands with my old boss, Herbert Hoover, and one of his sons. We have now (April,

1963) just returned from California again where we were called by the sudden death of my wife's sister. We were very fortunate to escape this trying winter in the East and, in spite of the occasion, really enjoyed the famous California weather and meeting some of my 'pen' friends who were anxious to see who was writing them about old times and mines in the Far West. My best to you and the old timers who are still extant. I would enjoy it greatly if I am lucky enough to hear from some of them."—**Elbert G. Allen,** Secretary, 11 Richfield Road, West Newton 65, Mass.

'01

I have recently received word of the death of **Antoine B. Campau,** IV, S.B. in Grand Rapids, Mich., on February 10, 1963. He was 84 years old. He was a very prominent local architect who designed many of the area's most famous buildings. He was prominent in Grand Rapids for more than 50 years. He is survived by his wife and two daughters. . . . **John Boyle,** III, Washington, D.C., writes: "Although now 84, I am reasonably active professionally as a patent attorney. I have accumulated a wife, three children and eleven grandchildren, all living in this vicinity. I have followed the patent legal line since 1903. I have procured hundreds of patents. I have tried about 30 cases in the courts relating to patents. The longest lasted 80 days in Wheeling, West Va., and my client won. I returned to government service in 1941 and represented various divisions of the administration." . . . **Philip W. Moore,** II, wrote from Nokomis, Fla., in February. He calls the Class Letter a necrology, but finds it interesting. He says: "There is no news of general interest in this household."—**Theodore H. Taft,** Secretary, Box 124, Jaffrey, N.H.

'02

There is little news to relay to the class, but perhaps we rest easy as no news is often good news. **Dan Patch** has recently been awarded a medal by the Sons of the American Revolution of which he is a member. The medal is to commemorate Dan's service to his country in the Spanish-American War. At the same meeting a kinsman, Robert B. Patch of Dedham, was presented with an S.A.R. medal in commemoration of his serivce in the two world wars. The program for Alumni Day promises to be very interesting, and I hope to meet a goodly number of our class at the luncheon in the big tent.—**Burton G. Philbrick,** Secretary, 18 Ocean Avenue, Salem, Mass.

'03

Well, classmates, I anticipate that within the next few days after your Review is received, you will have enjoyed our 60th Reunion meeting most heartily. A glowing report of it will follow in a later issue. . . . **John F. Hackman,** XIII, has passed away; no further data has been supplied to us. . . . Our 'Happy Birthday' congratulations go, however, to our classmate **Charles S. Glenn,** VI, who was 85 years old on April 4.—**John J. A. Nolan,** Secretary, 13 Linden Avenue, Somerville, Mass.; **Augustus H. Eustis,** Treasurer, 131 State Street, Boston, Mass.

'04

Just too late for inclusion in the previous notes a card was received from **Frank H. Davis** postmarked in Jamaica and dated March 11. The attractive picture made one feel like rushing out to buy a plane ticket. Since we are not crowded for space right now we quote Frank's note in full: "Mrs. D. read in The Review that we 'keep in the news' so I must tell you that we are in Montego Bay, Jamaica, for a couple of weeks. After all the blizzards in Michigan, this warm weather is good for what ails us. Yes, **Bernie Blum** and I will be at the reunion in '64. Sorry to hear **Reggie Wentworth** has passed away. He was in my class at Rindge Manual Training in Cambridge as were **Walter Hadley** and **Currier Lang.** I am dropping Currier a card also. We had a good trip down except they had to fly from Miami completely around Cuba to Nassau and Haiti but these jets are fast." Thanks for the card Frank. We hope others will follow your example and write about their activities.

The following clipping from the Springfield, Mass., Union refers to our late classmate **Austin Hoy**: "Staunton, Va. —A machinery manufacturer, who never saw Mary Baldwin College, has left the Presbyterian women's school $100,000 and his collection of World War I books, letters and studies. The gift was made by Austin Young Hoy of Westport, Conn., who died last August at the age of 81. Hoy's alma mater, the Massachussets Institute of Technology, shared equally with Mary Baldwin. Two English schools and Smith and Williams Colleges also received bequests. . . . The Bangor, Maine, News records the death of our classmate **Rowland Rice** on March 7. He worked for 40 years for a prominent Cleveland, Ohio, engineering firm.—**Carle R. Hayward,** Secretary, Room 35-304, M.I.T., Cambridge, Mass.; **Eugene H. Russell, Jr.,** Treasurer, 82 Devonshire Street, Boston, Mass.

'05

In spite of the fact that I have had an extra week between the writing of notes this month, the results have been almost negative. Ruth and I were "freighting" most of the month of March, starting from New York on a Standard Fruit Company banana boat, spending a day on an auto trip across the Republic of Panama, thence from Balboa to a small banana town in Ecuador, about two hundred miles south of the equator. We crossed the equator both times during the night, thus escaping (or missing) the proverbial ducking, but we do have the official diploma signed by old Neptune himself. I usually am able to find an '05 man (or at least an M.I.T. man), but on an almost nonstop straightaway voyage of 5,700 miles, there was not opportunity for visiting, nor even for buying trinkets, as the shops at Panama were closed on Sunday and the shops at Port Bolivar, Ecuador were nil. However, we did accumulate quite a coat of tan, which has disappeared in the cold spring of New Hampshire.

Through **Bob McLean,** our Class Agent, I have learned that **Clayton R. Simmers,** XIII-A, had a fall in November, 1962, requiring the removal of a knee-cap. About the time he became ambulatory in January, he suffered a cerebral vascular accident, paralyzing his right side and badly affecting his speech. At last writing he was able to walk a bit, but his speech has failed to return. Best of luck, Clayton. . . . On April 1, 1963, just over a year after her husband died, Andrea (Mrs. **Roy F.) Lovejoy** passed away. . . . These notes will reach you just in time to make arrangements to attend Alumni Day at Cambridge. While our ranks are a bit depleted, let us hope for the attendance of some of our non-regulars. You will enjoy the luncheon, the dinner and the Pops Concert with Arthur Fiedler conducting.—**Fred W. Goldthwait,** Secretary and Treasurer, Box 32, Center Sandwich, N.H.; **Gilbert S. Tower,** Assistant Secretary and Treasurer, 35 North Main Street, Cohasset, Mass.

'06

While preparing these notes, our class president telephoned to report an invitation to attend the dinner at the Waldorf on May 7 to honor Alfred P. Sloan, Jr., '95, and to celebrate the successful completion of the Second Century Fund. Jim said he would "regret," but I told him I hoped we could arrange transportation for him on June 10 so he could attend the Alumni Day luncheon. How about YOU? Inserted here is a postscript, for I have since talked with Vice-President **Chase** and find that he received a similar invitation and expected to attend the Waldorf dinner as he had planned to be in New York the next day to attend a meeting of the Consulting Engineers. When in New York recently, **Sherm** had a short visit with **Joe Santry,** VI, at his office in the Combustion Engineering Building. He reports that Joe seemed hale and hearty, but not quite as husky as when he played halfback long ago.

Early in April, I had a phone chat with Georgianna **Hinckley.** Because of arthritis she hadn't been out much during the winter but hoped in May to go out to Minnesota where **Tom** is buried—he had come to Tech from St. Paul High School —and to the Cape later. She is kept busy with many legal details, and conferences with lawyers. Also had a phone chat with **Guy Ruggles'** sister, Helen, in Reading,

his home town. She reported that Guy was in fine fettle and that he writes to her every week—a good guy! The chat with Helen was prompted by a long letter from Guy along in March. He and **Harold Plummer,** III, had attended the luncheon meeting that month of the Phoenix Club and commented on the attendance of only eight men. That is small, with about 71 M.I.T. men in Phoenix, 51 in Tucson, and around 45 more scattered through some 20 other towns in Arizona. In February Guy spent a pleasant six days in his "old stamping ground," Cananea, in Mexico just south of the line. He hadn't been back for over three years, and they gave him the red carpet treatment.

With all the new housing construction underway on the campus, you might be interested in a run-down of where-they-sleep-now. Besides Baker and Burton and the East Campus Houses, the Graduate House on Memorial Drive and the present women's dorm on Massachusetts Avenue, there are a Student House and a Freshman Dorm on Bay State Road and 28 Fraternity Houses—four on Memorial Drive, and the others in Boston, mostly on Beacon Street and Bay State Road. During a recent—and infrequent—visit to The Hub, I stood on Dartmouth Street opposite where Horace Ford and I had roomed for a few years at No. 196, and gazed at the heaps of rubble where that whole triangle had been razed to make way for the extension of the Massachusetts toll road. The building that was Technology Chambers, being on the other side of the B & A tracks, will be spared I believe. . . . Speaking of those old days, **Sherm Chase** had a letter in the Herald recently telling about the Hudson River rising so high in March, 1913, that it caused the flooding of the filtration plant and so contaminated the water supply of Albany, resulting in over 230 cases of typhoid there. But there was no mention of this event elsewhere, not even by the New England and American Waterworks Associations. The point he made was that prompt and much wider publicity is given to such cases today by all the news media; in contrast he mentioned the recent outbreak in Zermatt and recalled that 14 cases in New Hampshire in 1959 resulted in a 14-page article in the journal of the New England Waterworks Association. We can join Sherm when he concludes: "Today, thanks to preventive measures effected by sanitary engineering, water-borne outbreaks of typhoid are almost unknown in the United States." Incidentally, it was in 1911 that I contracted my case of typhoid, from milk, in Ohio.

David Bloom, V, still lives in Brookline but has moved to 191 St. Paul Street. . . . From the Alumni Office in February came a report of the death of **Ralph Hahnemann Jackson,** VI. The notice had evidently resulted from the return of mail from his Niagara Falls address, so there was no date or other information. From my sources I find that he entered with us, his home address being Jamaica Plain, and was a special in Course VI. By or before 1915 he was in charge of the installation of the Taylor System of Shop Management with A. & J. M. Anderson, a South Boston manufacturer of electrical materials. By 1925 he was efficieny engineer with the Carborundum Company at Niagara Falls, where his address continued to be 821-90th Street through the years. More details, especially the date of his death and about his family, will be greatly appreciated. . . . A clipping from a Quincy paper reported the death on January 16 of **Henry Hawkins Nelson,** II, "in a Concord, N.H., nursing home after a long illness," in his 80th year. In The Technique, Henry was listed as '05 through all four years, in Course II Special, but presumably because he graduated with us and so wished, he has been on the '06 list ever since. For the first few years he was a draftsman with Stone and Webster in the Boston office, but by 1910 had entered the field of fire protection, in which he continued until he retired in 1955. He was on the staff, as supervisor, then fire protection engineer, of the Associated Factory Mutual Fire Insurance Companies, in Boston. In a note to Sherm he told of a long illness at Faulkner Hospital. The clipping said he had lived in Scituate for 45 years (possibly summers as our addresses are all Boston or Jamaica Plain) and was a member of the Elliot Masonic Lodge of Brookline. No relatives are mentioned.—**Edward B. Rowe,** Secretary-Treasurer, 11 Cushing Road, Wellesley Hills 81, Mass.

'07

John Frank wrote to me after visiting **Sam Marx** in Palm Springs, Calif., last February as follows: "I found Sam in fine shape, and they are living in Mrs. Marx' brother's house, which is probably the most beautiful house in Palm Springs. A deluxe swimming pool, of course, and Sam enjoys going in and floating around on an inflated tire. I found it a wonderful place for water color painting; weather was superb. It was 88 degrees the day I left there, and six hours later it was 5 degrees below when I arrived in Chicago." Thanks, John, for this report, as all the class are greatly interested in Sam. . . . A note from **Tucky Noyes** tells of a visit he had from **Tommy Gould,** who was on a business trip up-state in Maine. He says Tom would "pass for a young 65." . . . Visiting with class members is something we could do more often; then send the secretary a report of your visit to share with the class through the Review notes.

Gil Small wrote me of the death of his wife, Christine, on March 15 from a heart attack. I wrote him expressing the sympathy of the class. Gil has lived in a large eight-room house in Wayland since 1919. The Smalls had two sons and also brought up two nieces. The sons are married, one living in Wayland and the other in Marblehead. Gil has four grandchildren at present. He plans to take a six-month leave of absence from his office for readjustment. I am sure he would appreciate hearing from any of the '07 men. . . . **George W. (Bill) Otis** has given me his summer address as Hillcrest Road, North Chatham, Mass. This is on Cape Cod. Anyone visiting the Cape should try to look Bill up. . . . In one of the Savings Bank publications, it was noted that **Philip B. Walker** was recently elected president of the Whitinsville Savings Bank.—**Philip B. Walker,** Secretary and

Deceased

SUMNER B. ELY, '92, Feb. 22
GEORGE L. BIXBY, '95, April 10, 1962*
MRS. ARTHUR F. CAMPBELL, '96, April 8*
GEORGE H. KNIGHT, '97, April 1*
LEROY H. BYAM, '98, June 17, 1962*
ARTHUR I. FRANKLIN, '98, March 21*
EDGAR W. NORTON, '98, Sept. 4*
MRS. HELEN S. PARKER, '98, Feb. 17
JOHN E. WARREN, '98, Jan. 17*
CHARLES H. DEERING, '99, Feb. 11, 1962
ANTOINE B. CAMPAU, '01, Feb. 10*
CHARLES R. CARY, '04, Feb. 24
ROWLAND G. RICE, '04, March 7*
HARRY S. PERCIVAL, '05, Jan. 3
RALPH H. JACKSON, '06*
HENRY H. NELSON, '06, Jan. 16*
WILLIAM B. COFFIN, '07, March 1
FRANCIS C. V. CROWLEY, '09, Feb. 3
JOHN A. WILLARD, '09, March 14*
CLAUDE T. WILSON, '09, Jan. 9
HARRY D. G. BAXTER, '10, Feb. 12
JOHN H. O'NEILL, '10, March 17*
JOSEPH S. MURRAY, '12, March 19
ALLEN W. REID, '12, Feb. 20*
ROBERT E. SELBY, '12*
HAROLD H. SHARP, '12*
C. KIRK HILLMAN, '13, March 30
E. B. LONG, JR.,'13 , Feb. 20
THOMAS F. COMBER, '14, June 17, 1962
WALTER H. BROWN, '15, Aug. 8
PHILIP O. KEENEY, '15, Dec. 19*
PAUL A. DEMARS, '17, March 14*
HERBERT F. JERMAIN, '18, March 25
MASON S. NOYES, '19, Sept. 26
JOHN P. GRILLI, '20, March 9
MERRITT H. TAYLOR, '20, March*
LINCOLN B. BARKER, '21, March 16*
LEWIS S. EDGARTON, '21, Feb. 20
ERNEST A. PEARSON, '21, Jan. 1
EDWARD D. COOGAN, '22, Sept. 7*
HENRY R. TOMLINSON, '22, Jan. 12, 1962*
MRS. EXCELLENZA M. WESTBY, '22, Dec. 2
LAWRENCE E. DUANE, '23, Feb. 24*
ALAN L. CAMPBELL, '24, March 20*
GUILD R. HOLT, '24, Jan. 20*
WILHELM KUPFERBURGER, '24, 1962*
HARRY G. MINER, '24, Oct. 18*
JOHN J. PARSONS, '24, March 9*
FRED C. WAGNER, '24, Jan.*
JOHN R. LYONS, '25, Feb. 20
HAROLD B. GORDON, '26, April 13, 1962*
GEORGE P. RUPERT, JR., '26, March 14*
DOMENICO SICARDI DE AMICIS, '26, Jan. 10*
ERMANNO A. BASILIO, '28, March 30*
DAVID W. CRAWFORD, '28, 1963
EDWARD J. MURPHY, '29, March 9, 1962
OTIS A. SIBLEY, '31, Nov. 20
JAMES H. BURNHAM, '34, 1962
AMBROSE MCALEOY, '34, Jan. 3
ROGER E. NEEDHAM, '35, April 9
HAROLD W. GEORGE, '36, Jan. 28
CARL A. OLSSON, '38, July 31, 1961
MARK R. KINTER, '51, March 13
JOSEPH E. ROSE, '58, Nov. 12*

*Further Information in Class News.

Treasurer, 18 Summit Street, Whitinsville, Mass.; **Gardner S. Gould,** Assistant Secretary, 409 Highland Street, Newtonville, Mass.

'08

This month we celebrate our 55th anniversary. Our 55th Reunion will be held at the Melrose Inn, Harwichport, Mass., on The Cape, June 7, 8 and 9. Headquarters will be the Beach House, as in the past. This will be our seventh visit with the Smiths. Ladies are invited, and June is nice on the Cape, so better join us for a pleasant weekend. Monday, June 10 is Alumni Day at Cambridge. There is lots to see and plenty to do—luncheon will be served on the Great Court, cocktail hour in the green at Briggs Field, the banquet at the Rockwell Cage, and the Boston Pops concert with Arthur Fiedler will be in Kresge Auditorium. The day will make a fitting climax for our 55th. . . . Don't forget the 1963 Alumni Fund. There is still time to give. 1908 has done well in the past. Let's keep it up.—**H. Leston Carter,** Secretary, 14 Roslyn Road, Waban 68, Mass.; **Joseph W. Wattles, 3d,** Treasurer, 26 Bullard Road, Weston 93, Mass.

'09

It was with great sorrow that we announced briefly in the May Review the death of **John Willard,** II. A three-column obituary notice with John's picture appeared in the Boston Herald of March 15 describing John's distinguished career in some detail. **John** and Margaret **Davis,** representing the class, visited John's sister and his daughters at Wrentham the day prior to the services which were held there. John Davis has written the following tribute: "John Artemas Willard was born in Wrentham, Mass., September 29, 1887, owned his home in Needham, and died suddenly in the hospital on March 14, 1963. He was the son of Artemas and Mary (Ballem) Willard. John grew up on a farm at Willard's Corner in his native town of Wrentham where he learned at first hand the carpentry and building business from his father. John was graduated from Wrentham High School, entered M.I.T. in 1905, and was graduated from Course II in 1909. During his four years at M.I.T., he made the round-trip daily from Wrentham to Back Bay on the New Haven Railroad, taking two-and one-half hours—he was a typical Yankee! In 1911 John married Marion Hall, also of Wrentham. They had four children: Mrs. N. H. Wentworth, Mrs. Frank L. Cusumano, Mrs. Leslie M. Bell, and John A. Willard, Jr., who was graduated from M.I.T. in 1950. He lived with his father in Needham and entered his father's company, Bigelow, Kent, Willard and Company of Boston, of which he was president. John's love of family, his friendliness, and his keen sense of humor endeared him to all. He enjoyed hunting and fishing, but his favorite hobby was working on old clocks, particularly Willard clocks invented by his ancestor, Simon Willard. In 1955 he suffered the loss of his wife. Then his sister, Mrs. Bertha Davis, a widow, came to live with them.

John's business activities showed he was very progressive. After graduating from M.I.T. he was assistant instructor at the Institute one year; foreman of the Trenton Iron Company one year; draftsman, plant engineer, and general superintendent of Bemis Bag for 10½ years, and with Cooley and Marvin 2½ years. In May, 1924, he became treasurer of Bigelow, Kent, Willard and later became president. John was a member of the A.S.M.E. and its past-president; he was also a member of the Society for Advancement of Management, and many other organizations."

In the obituary notice in the Boston Herald it was stated: "In lieu of flowers please make donations in the name of Mr. Willard to '09 Alumni Fund, M.I.T." Hence, in addition to writing to Mrs. Davis expressing the sympathy of the class, as well as our own, the class made a contribution to the Alumni Fund. Several classmates, as well as others, have also made contributions. For example, George R. Wadleigh, '97, writes from Yonkers, N. Y., as follows: "The news of the sudden death of John Willard has just come to me as a great shock. We were closely associated for many years. In lieu of flowers we were asked to make a contribution to your 55th Reunion due next year. Hope I have made out check in proper form" . . . Henry B. Kane, '24, Director of the Alumni Fund, wrote on March 28: "All told we have received 19 gifts to date in Mr. Willard's memory." (Later we will announce further gifts when received.) Mr. Kane also wrote: "A distinguished alumnus, Mr. Willard had been a loyal supporter of M.I.T. through the years. I know he would have been highly pleased at this evidence of the esteem in which he was held by his friends."

We have received two notes from Mrs. Davis, excerpts from which are as follows: "Professor Dawes: I have re-read your letter of March 18, written when you learned of John's passing and am extremely grateful for the loving tribute you gave him. He was very proud of being one of you all. . . . The family and I deeply appreciate your (class) gift to the Alumni Fund in John's memory. The Alumni were always dear to him, and I am sure he would be pleased. I also want to thank you for all you have done in connection with the gifts, the lists you have sent so that I might acknowledge, and many other details."

With reference to reunion activities, the committee planned to meet in late April or in early May, as soon as all the members were available, to reach a decision, if possible, on the meeting place and to formulate further plans. . . . **Art Shaw,** I, wrote from Sarasota, Fla., as follows: "I had a letter today from **Keyes C. Gaynor,** I, enclosing his contribution to the Alumni Fund and also some literature relating to his current interests. He had an article in the August, 1962, issue of "The American City" describing concrete pavement which he installed when city engineer of Sioux City, Iowa, over 50 years ago; it is still in serviceable condition. The use of concrete for pavement was then in its infancy and Keyes had to supply his own design criteria. More recently he has been developing and promoting an ingenious method for loading and unloading trailer truck bodies on flat cars by means of turntables and elevators. His scheme would appear to offer interesting possibilities for use at 'piggy-back' terminals. . . . Betty and I are planning a slight variation in our annual 'routine' by interjecting a short Caribbean cruise early in April before returning to Auburndale. We leave Port Everglades (near Fort Lauderdale) April 6 on the 'Hanseatic,' 30,000-ton Hamburg-Atlantic liner, returning April 11 for a final week or so before starting north." . . . **Tom Desmond's** secretary writes: "Thomas Desmond is the author of an article in the April, 1963, issue of the magazine 'Life and Health' entitled 'Food and Fitness in the Senior Years.' "—**Chester L. Dawes,** Secretary, Pierce Hall, Harvard University, Cambridge 38, Mass.; Assistant Secretaries: **George E. Wallis,** Wenham, Mass.; **Francis M. Loud,** 351 Commercial Street, Weymouth 88, Mass.

'10

Through the kindness of Walter F. Connolly, '11, I received a clipping from the Lowell, Mass., Sun about the death of our classmate **John H. O'Neill:** "John Henry O'Neill, Sr., 75, a consulting engineer, died last Sunday, March 17, at the Baptist hospital. He resided at 637 Lowerline Street, New Orleans, La. A native of Lowell, Mass., he is survived by his wife (Albion Edwards); a daughter, Mrs. W. A. Summers of Indianapolis, Ind.; two sons, The Reverend Charles E. O'Neill, S.J., and John H. O'Neill, Jr.; six grandchildren; two sisters, Miss Katherine O'Neill and Mrs. Mary Harrington; and a brother, Charles O'Neill, the latter three of Lowell. . . . A veteran of World War I, he was a captain in the Army Sanitary Corps. He was a graduate of Massachusetts Institute of Technology and established the division of sanitary engineering of the Louisiana State Department of Health in 1913 and retired in 1955 as director of that division after 42 years. Mr. O'Neill was a member and past president of the Louisiana Engineering Society, and a member of the American Waterworks Association and former vice-president of the southwest section of the association. In 1951, he was awarded the association's George Warren Fuller Award, which is presented each year for distinguished service in the water supply field. A member of the Louisiana State Stream Control Commission from 1940 to 1948, he was one of the founders of the state's conference on water supply and sewage, an organization credited with playing an important part in raising the safety standards of water supplies and sewage disposal. Mr. O'Neill was a member of the Louisiana Association of Public Health Workers and in 1951 he received

the first C. B. White Award for meritorious, diligent and long service to the people of Louisiana in the field of public health. He was also a member and past chairman of the conference of state sanitary engineers which is a national organization."

Met **William Wallour** recently, and he certainly was looking well. He has not retired and keeps busy as executive vice-president of Babson Reports.. He claims that by keeping busy he looks younger than he is and is enjoying life. . . . As for myself, I spent two weeks in Mexico with my partner, Waldo F. Pike, '15, and had a most enjoyable time. We attended the 15th Annual Fiesta of the M.I.T. Club of Mexico City and were so royally treated that both of us did not realize we were the oldest Alumni attending this wonderful affair. This was my second attendance at this hospitable club's annual meeting, and I have hopes of attending another. We enjoyed the usual tourist trips about the city, the pyramids, and the University of Mexico with its modern buildings of decorative murals, mosaics, etc., on the exteriors. We also went by auto to Cuernavaca, Taxco, and Acapulco —very interesting cities, except for the latter which is nothing but a pleasure resort. The only part of the trip I would not care to repeat is attendance at the bull fight. However, there is probably more to these affairs than is apparent to one seeing one for the first time when 30,000 spectators show so much enthusiasm.—**Herbert S. Cleverdon,** Secretary, 120 Tremont Street, Boston, Mass.

'11

Earl R. Brown, II, of Ventnor, N.J., died December 19, 1960. No further details were received. . . . **Merton Hopkins,** I, moved from Stamford, Conn., March 26, to 1505 Norwood Place, Clearwater, Fla. . . . **David Bartlett,** VI, moved from Laconia, N.H., February 20 to 236 Olmstead Avenue, Indian River City, Fla. . . . **Norman Duffett,** X, returned February 28 from Lake Worth, Fla., to his home a. 909 James Avenue, Niagara Falls, N.Y. . . . **Marshall Comstock, VI,** returned March 13 from Pleasant Point, Maine, to his home at 9 Brooks Street, West Medford 55, Mass. . . . That's all the news I have received. There was no entry sent in for the May Review because I was in the hospital, for about three weeks, and then in a nursing home for three more weeks ending March 30. This was the first time 1911 has not been included in The Review's Class News. Hope to see a lot of you at Tech on Alumni Day.—**Henry F. Dolliver,** Secretary, 10 Bellevue Road, Belmont 78, Mass.

'12

Harold H. Sharp, formerly of Larchmont, N.Y., passed away in Asheville, N.C., where he had been living since retirement in 1957. He served as president of the Howe Sound Company of New York for many years. Before coming to the Institute, he was graduated from Boston University and then was with us in Course III. . . . Word has just been received of the death of **Robert E. Selby.** Unfortunately, no further details are available. . . . **Allen W. Reid** of Reading, Pa., passed away on February 20, 1963.

A good letter from **Jay Howard Cather** of Rochester compared his starting salary of $1,040 with Eastman Kodak in 1912 with the $7,000 offered for this year's graduates. In checking further, Howard phoned the hotel in Rochester where he roomed at $4 per week and found that the rate is now $4.50 per day. So much for the good old days. . . . **Harold Brackett** and his niece Miss Forbes were in Florida this winter with **Larry Cummings** in Clearwater. **Jim** and Hilda **Cook** drove down to Florida and were with them for some time. On the way the Cooks stopped at Jekyll Island for two weeks. . . . **Johnnie Noyes** advises that the **J. H. Pratts** stopped in Dallas on their way to Mexico and talked over the good times enjoyed at our 50th Reunion. . . . **Cy** and Marjorie **Springall** spent the winter at Scottsdale and Tucson, Ariz., and then went on to La Jolla and San Francisco for a visit before returning East.—**Frederick J. Shepard, Jr.,** Secretary, 31 Chestnut Street, Boston 8, Mass.; **John Noyes,** Assistant Secretary, 3326 Shore Crest Drive, Dallas 36, Texas.

'13

When you read these notes it will be a matter of days before we return to our alma mater 50 years after most of us received our "sheep-skins." Can we ever repay Massachusetts Institute of Technology the great debt we owe the most outstanding scientific research institute in the world? Yes, in part, first by returning to the portals and joining with this year's graduates in celebrating their advent into a world of ever expanding space exploration and knowledge. As of this early day in April, over 90 of your classmates and their guests have signified their intentions of joining President Stratton as the guests of the Institute at the Commencement exercises and luncheon. Then on to Oyster Harbors Club for over three days of reminiscence and good friends of 1913, then back to Cambridge to Alumni Day to mingle with other friends who have shared the advantages of being a Tech man. Will you be one of the fortunate celebrators at your 50th? **Lammie Lemaire** is leaving Australia on April 15 to spend a few days in the atmosphere of those days of yesteryear. . . . **Prescott Kelly** with his dear wife, son George, '42, and wife, will be here from Birmingham, Ala. . . . **Harold Crawford** and his better half will journey from Walla Walla, Wash.; the other classmates participating in our "Homecoming" will arrive June 7 from other way stations in between those distant points. Can you afford to miss this focal point in your life? We shall expect you and your dear ones.

We have been informed by the Alumni Office and also **Larry Hart** that our classmate, **E. B. Long, Jr.,** of 31 North Broadway, White Plains, N.Y., passed away February 20, 1963. To Ed's family we offer our sincere heartfelt sympathy. From Long's son, Edward B. Long, 3rd, '48, we would appreciate more detailed information concerning his father's career and his death. . . . The response and co-operation that the many so-called 'leaders' have given your reunion chairman has been very gratifying. **Ralph Thomas,** Baltimore, Md., is contacting those in his vicinity and he writes: "I graduated from Princeton with a A.B. degree in 1909, taught in prep school for two years, and then went to M.I.T. for two years. My Princeton class, in which I have some close friends, is having a class dinner at Princeton on Friday evening, June 7. At present I am planning to go to Princeton for this dinner and then drive to Oyster Harbors with my wife on Saturday. This will break the trip; I don't like long drives. Returning to your note, I will be glad to help you if you think I can be useful. Perhaps I have already done at least a part of the assignment." . . . **Pete Haynes** writes that he and Mrs. Haynes spent the greater part of February in Arizona and they expect to go to the reunion, June 7, at least through the 9. **Charles Trull** is contacting the Rhode Island delegation and will be with us in June. **Heinie Glidden** is very much on the ball; he reports that **Dan Ricker** will probably come as he is buying a house near the Oyster Harbors Club. . . . **Gordon Robb** will probably attend the banquet, June 8. . . . **Jack Horner** will be present. Heinie will also exhibit some of his latest paintings. Jack Horner writes that he has been laid up with a busted hip since last August, but expects to be able to navigate by June 7. We shall be expecting to see you Jack, as usual, and will choose a couple of our electromotive engineers to steer you around.

Geof Rollason has come through as usual. His ten strike is his quotation from Lammie Lemaire's recent letter; "At long last I have been able to finalize my arrangements and can now definitely say that I am coming to Boston on the United States Shipping Line 'S.S. Pioneer Glen,' leaving Brisbane on Easter Monday the 15 April and DV arriving Boston on May 21. I will definitely attend the Class Reunion and will give a talk with slides on the Middle East or on Australia (with transparencies) if I am wanted. So if you are writing **Phil Capen** you might let him know, as I have mislaid his chits." . . . Also, **Millard Merrill** is interested in Alumni Day. . . . **Raymond Bergen** hopes he can attend the 50th. . . . **Frederick Stillman** "has not made up his mind." . . . **Chauncey Crawford** is in doubt. We sincerely hope you will be with us, Chauncey. . . . **George Bakeman,** has been on the job in Virginia. He writes: "Mother and I have now definitely decided to drive North for the meetings in June and you can therefore count on us." Also, Professor **A. Lawrence Kocher** expects to be there in June. . . . **Charlotte Sage** adds that she has been away but will complete her assignments soon

and states: "Had a nice note from **Marion Hart** from DAKAV. Says she will be in New York in May and take her plane to Bedford for a check up and will get in touch with us; sounds as though she might appear." . . . Larry Hart surely digs them out. He reports that **Henry C. Harrison** is considering joining the festivities. . . . **Vernon Kay** may return for the reunion. . . . **Louis Wright** has replied that he and his charming wife will arrive on June 7 and he will contact our classmates in his vicinity as well as **Seaphes Shinkle. . . . Bill Mattson** and his nice wife, Jo, will arrive in Boston, June 3, over 2,000 miles from Denver. Again, as usual, Bill has covered large territories, and we expect that many of you will want to meet 'Mr. Reunion,' again. . . . Prescott Kelly, besides coming to the 50th, is also bringing three guests, but he is contacting those in the Deep South.

"Our Roving Reporter" or **Gene Burrell,** Our Leader in Texas, where everything is either big or wild, is still beating the sagebrush and we hope he and his fellow Texan classmates will grace the portals of Oyster Harbors Club come June; Gene retired April 30, 1960, after many years as an expert and consulting hydraulic engineer; he is author of many treatises on hydrology. One of the earliest engineers for the Tennessee Valley Authority, he remained with the TVA for 12 years. He worked under Civil Service for 29 years, including many years with the Corps of Engineers with headquarters in several big cities in Texas. He has made many contributions in the fields of hydraulics and hydrology and is the inventor of the "Constant Factor Methods of Computing Sedimentation" which is used widely in connection with problems of sediment distribution in reservoirs. While with the TVA, Gene made a study of the historic floods on all of the principal streams throughout the Tennessee Valley and estimated peak flows for these floods. This compilation is constantly used by TVA hydraulic engineers and is known as "The Burrell Bible." Gene has been a roving reporter as the result of many trips all over the country and has been a valuable contributor to 'The Tennessee Valley Engineer.' Well, Gene, with all that desire to travel investigating floods, come back to Boston where we also have floods and where money flows in large amounts to the wrong reservoirs.

Harold Crawford, ever our real correspondent from the great Northwest coast, keeps us informed of our classmates in his territory. Harold and his dear wife will be with us in June and also hopes to have **Harold Marsh** and his wife join them in their safari to Cape Cod in June. . . . **Bill Brewster** has been patrolling the beaches on the Cape and believes that **Ed Hurst** and wife will join us at Oyster Harbors. . . . **George Cahill** and several other Cape Coders (who are away at the moment) will undertake the arduous trip to Osterville. From the confines of Michigan, comes word that **Tom Lough** and his wife will participate in the never-to-be-forgotten weekend at M.I.T., and Oyster Harbors, then back to Cambridge for Alumni Day. Tom is also rounding up the other Michiganites of 1913 for a refresher course at "Boston Tech" as she is today and the salty atmosphere of Cape Cod. . . . **Charlie Brown** has been making larger dividends for the stockholders of the N.E. Tel and Tel Company. He reports that he expects to greet **Walter Merrill** as well as **Edward Bridge;** also **Samuel Crocker** and **Richard Cross** will or may make the reunion. Further, Charlie informs us that he will retire from his engineering career, and he and Mrs. Brown will move to Columbus, New Mexico within the year. . . . **Gene MacDonald** is our good-will ambassador in the wilds of Jersey and New York and making appointments with the course and seat mates from 1909 through 1913. Chick Kane, '24, has complimented Bill Mattson and your Reunion Committee for its efforts toward making a record attendance and presenting the Institute with the largest token of appreciation ever. We have given our best endeavors. The accomplishments which we hope to attain are now in your hands. We are looking forward to greeting you and yours at Cambridge and Oyster Harbors.—**George Philip Capen,** Secretary and Treasurer, 60 Everett Street, Canton, Mass.

'14

As many of our classmates have learned, retirement for most means more work rather than less since we have to do it all alone. **Ray Dinsmore** should receive the prize. In addition to setting up a consulting business, he is now going full speed ahead, not only arranging for our 50-Year Reunion, but also soliciting special funds for our Class Gift. In a recent letter he wrote: "Because of the importance of our 50th Reunion and the traditional ceremonies that are connected with it, it is expected that many of our classmates will want to have their wives in attendance; however, some of us have had the strong feeling that a stag affair on Saturday afternoon and evening would help to carry on our class traditions and to renew old friendships. For this reason, we are planning to arrange such a party for Saturday afternoon, June 13, 1964, extending through dinner and as late into the evening as each individual may wish, and to be held at an appropriate place at or nearby Boston. If you have any interest in such a stag affair, please let us know promptly because it is not too soon to commence the necessary arrangements."

Frank Ahern is still in Washington, and, like the sailor who takes a ride on the swan boat in Boston Public Gardens, he makes frequent visits to the capitol to listen to hearings on the matters in which he is interested. He writes: "I have attended a number of Congressional committee hearings and find many of them informative and interesting. I have attended hearings on urban renewal, transportation, economics, the drug scandals, and others; the information is revealing, 'slanted' in many cases, and, in the case of economics, a pedestal from which the professors air their egghead theories." . . . We had a nice chat the other day with **Clarke Atwood.** As he was always a frequent visitor, at least by telephone, I had thought that he had been winter-bound on Martha's Vineyard, as **Dean Fales** was in Maine (unfortunately, Dean's report is not quotable). But unfortunately, Clarke had injured his leg and was laid up for over six months. He claims that the long wait was not due to weather since Martha's Vineyard enjoys a climate similar to Bermuda's. It was the distance and method of transportation that made our decision not to have our reunion at his fine hotel there instead of in Cambridge.

Homer Calver, who has been wintering in San Miguel de Allende in Mexico, about 150 miles north of Mexico City, decided to go to Mexico City for the M.I.T. Club of Mexico Fiesta. Part of his report is as follows: "The Fiesta was a wonderful party. There were charming hosts—the Cornishes—lovely surroundings, lots of wonderful food, music, dancing and whiskey to drink (whiskey is scarce at parties in Mexico). The pinata was a big red beaver. I hope the editor of The Review will play up these Mexican Fiestas. They are worth a special trip to Mexico. Everyone, of course, missed Lobdell." Quite aside from the Mexico City Fiesta, Calver also wrote from San Miguel: "Last night here in San Miguel was a big do. Indian dancers, band concert, wonderful fireworks, hundreds of people —mostly Mexicans—walking around the square—a special dinner for the Mexican-U.S. Interlegislative Commission, etc. So while we sat in the Jardin (as the square is called here) watching the goings-on, who should come by but **Alden Waitt** and his daughter. He is president of the San Antonio Art Center and San Miguel is noted for its artists. Incidentally, I did not know that Alden had become an artist of some reknown himself. We agreed that we would meet again at the class reunion next year. . . . I have been taking some courses at the Instituto Allende here, an excellent school. I had thought of registering for credit but decided it was a little late in life to try for an M.A. or Ph.D."

Alden Waitt, following the visit with Calver, wrote an interesting letter on his trip to Mexico with his daughter Betty. Part of the letter follows: "I came here to San Miguel de Allende on a quick trip to interview a couple of artists and instructors in painting who are good possibilities to take the place of our senior instructor at the San Antonio Art Institute, who is leaving the school at the end of this term. Betty drove down with me, doing most of the driving, and we intend to return following my conversations with the two prospects. It is a long, tedious hot ride—two full days on the road pushing all the way—and I do not look forward to the return. But there is no air service and I couldn't face the train ride. Last night a fiesta with lots of fireworks was held in the town plaza. As Betty and I were walking around the plaza waiting for the fireworks to start and watching the very colorful Indian dancers, someone plucked my coat and I looked down to find Homer Calver and his wife sitting on

one of the benches. They have been in Mexico since January and Homer has been studying painting and design at the Instituto Allende. He says he is going to start writing again at the end of the course he is now taking. We had a nice chat and promised to do our best to meet at the 50th next year. Homer attended the M.I.T. Fiesta. I had planned to attend, as I may have written, but the sad fact that I would not meet Lobby there decided me against going at the last minute. I am sorry now that I didn't go after all. It was good to see Homer and his wife. My one man show in San Antonio was closed out early this month and most of it moved to a small gallery downtown. I had big crowds at the opening and during the month. Sales were not much but I sold one small landscape 18 inches by 24 inches for $300, and a couple of others a bit larger for $285 each, so I got my bait back at least. I had excellent reviews in the press and will mail you copies when I get back if I can find them . . . Right now things are very busy at the Art Institute, and I have not had time to do any painting. Mr. Peter Lanyon, a distinguished British avant garde painter from St. Ives, Cornwall, is our guest artist for the entire month of March; I have been with him quite a bit. And the miserable business of letting our director go has made it a trying period. . . . Also, the Science Fair was held the first of the month and that knocked out more time. If I do not get a brush in my hand soon I'll go nuts. The act of painting has become a necessity."

A personal friend of mine has recently shown me some of the clippings about Alden's painting. One who had never painted until retirement and who has become so well-known so quickly is entitled to a great deal of credit.—**H. B. Richmond,** Secretary, 100 Memorial Drive, Cambridge 42, Mass.; **Charles P. Fiske,** President, Cold Spring Farm, Bath, Maine; **Herman A. Affel,** Assistant Secretary and Class Agent, R.F.D. 2, Oakland, Maine.

'15

This is a Class and it's OUR Class! On April 5, at the M.I.T. Faculty Club, Cambridge, 28 classmates and their guests met for another enthusiastic, lively and enjoyable class meeting, with cocktails and a delicious Bill Morrison dinner. **Pirate Rooney,** as loose and as agile as in Summer Camp days, led off with a "We are happy" cheer. **Ralph Hart**'s 3-D colored slides of our 1955 Coonamessett Reunion provoked a lot of "oohs and ahs." Many thanks, Ralph. **Ben Neal** and **Charlie Norton** stayed over with us as house guests, and we enjoyed a relaxing breakfast next day, with good conversation. **Max** spoke briefly about the Alumni Fund and Ben brought us up to date on our 50th Fund. Then **Al Sampson** reviewed plans for our annual Class Cocktail Party, Monday afternoon at 4, June 10, (Alumni Day) at the M.I.T. Faculty Club. He and Barbara Thomas assure you all (and you are all invited) the usual delightful time together. See you there!

It was so pleasant to have sons and relatives of the class with us to share the evening and carry on our 1915 spirit: Herb Eisenberg, Jerry Rooney, Bill Sheils and Larry Lander's nephew Herbert Rosenberg. Come again, boys. Al Sampson's guest, Mr. Rudolph Dick, former president of Naumkeag Stearn Cotton Company, Salem, Mass., was a welcomed addition to our head table, and we hope he will come again. Jim Hoey, President of 1943, was, as usual, with us. Unchallengable evidence of devotion to 1915 was the hot long distance competition: Larry Bailey (in fine health again), Duxbury; Whit Brown, Concord; Archie and Fred Waters, Marblehead; Al Sampson, Beverly; Max Woytholer, Framingham, Charlie Norton, Martha's Vineyard; Stan Osborn, Hartford, Conn.; Pop Wood out of retirement from Peterborough, N.H.; a special tip of the hat to the Lowell Twins who never miss and always add so much to our dinners; Reggie Foster and Chet Runels; and the Winnah, Ben Neal, Lockport, N.Y. How you going to beat or even tie that for attendance? We greatly missed some regular attendees who couldn't make it: Jack Dalton, Ralph Curtis, Evers Burtner, Louie Young, Wayne Bradley and Harry Murphy. Messages from Hank Marion, Bur Swain, Ed Sullivan and Boots Malone cheered us up. Only 26 months to our 50th and already, all over the country wheel chairs are being repaired and greased. Ah me! . . . **Wally Pike** told us about his exciting and colorful trip to the Mexico City M.I.T. Fiesta in March and would like to see us hold a class meeting down there next year. Present at the dinner were: Larry Bailey, Bill Brackett, Whit Brown, Sam Eisenberg and his son, Herbert Eisenberg '52; Reggie Foster, Jim Hoey, '43, Larry Landers and his nephew, Herbert Rosenberg; Azel Mack, Archie Morrison, Frank Murphy, Ben Neal, Stan Osborn, Wally Pike, Pirate Rooney and his son, Pirate, Jr.; Al Sampson and his guest, Mr. Rudolph Dick; Frank Scully, Bill Sheils, Jac Sindler, Fred Waters, Easty Weaver, Pop Wood, and Max Woythaler.

How does he do it? Just when it looked as though that nomad **Jerry Coldwell** would stay grounded for a time in the luxurious surf and sand of Florida, he took off for a long trip through Greece and Italy and way stations. Jerry has to be the same age as the rest of us, but he certainly makes us feel old and sedentary. . . . **Bridge Casselman,** in good health again, writes that he hopes to be at the Class Cocktail Party. . . . **Ken Boynton** recently returned from a Mexican trip to become involved in tax returns. . . . **Ellis Ellicott,** Chairman of the Board, Ellicott Machine Corporation, Baltimore, writes that he is busy in their business, but traveling less and looking forward to our 50th. We will all be glad to see you, Ellis. . . . **Evers Burtner** returned from a six-weeks motor trip to the Florida west coast to find 10 inches of snow on his lawn in Wakefield, Mass. He writes: "After 12 years of Nautical Museum work at Tech, most of the time in addition to other duties, it will seem strange after June not to be responsible for the Museum. I feel that the issuance of copies of historic yacht plans to interested persons and yacht owners, has helped give the Museum a standing above that produced by museum display alone."

We are all glad to know from his splendid letter that **Herb Anderson** is back in circulation and again enjoying traveling. From Pompano Beach, Fla.: "So many of our friends have retired to homes in Fort Lauderdale that it's like being in a revolving squirrel cage. One of my friends is the head of the Department of Criminology at Florida State University. You might keep that in mind, but I hope it is not necessary with the high calibre of our classmates. At Tallahassee we had a wonderful day cruising on the Gulf. Between stone crabs, crab fingers, fried chicken with a light spread of really new stories helped along by good practical liquid refreshments, the time passed rapidly. (Herb apparently has not changed much). I have collected a few new stories which you may hear if Fran and you ever find your way to Winding Brook Farm. They do seem to relieve the dullness, even though some are more in harmony with 26 years of age than our own seasoned minds. Oh, to be 66 again or even 69. On the way down I tried to locate **Jim Tobey** but no luck. Perhaps with all those terrific books and articles he has written he is hyphenating his name. Best regards to all classmates."

I am writing this column just before we leave for Los Angeles for a dinner there with classmates and their wives, sightseeing with **Ray** and Margaret **Stringfield** and Ruthie **Place** (we hope) and then sailing on April 12 for a six-weeks South Pacific cruise on the "Mariposa." Then, upon our return to San Francisco we expect to have dinner and do some more sightseeing with the Fifteeners there. We'll be back in Boston in plenty of time for our Annual Class Cocktail party on Alumni Day. With his dues check to "keep the class spirit liquid" Al wrote: "My main activity now is getting ready for the Class Party in June. Barbara (Thomas) and I have some plans that should make it a grand family affair. Have fun on your South Seas trip. Study up on the 'Hoola' so Fran and you can show us stay-at-homes at the Class Party how 'them muscles do behave.' (Any orders for grass skirts?) I retract the recent good natured legpulling I've been giving **Bur Swain,** for with a big dues check he disclosed that he belongs to my union; he is secretary of the 1914 Class at Stevens Institute of Technology, from which he transferred to M.I.T. with us. And are we ever lucky—what a swell guy. He wrote, "I know how hard it is to compile class notes out of nothing." He enclosed one of his columns of class notes from the Stevens Alumni Review which closes "Secretary needs news—give!" I really feel for Bur now and maybe we should commiserate together.

With their dues checks our classmates from all over the country have sent some fascinating letters which follow alphabetically. **Allen Abrams,** Wausau, Wis.: "A quick note to appreciate the great

work you have done for the class over these many years. I salute you! I am still working with the A.D. Little Company on pulp and paper problems; carrying on some civic work—American Red Cross; Board of Education; Chemical Advisory Board to what we used to call Quartermaster Corps; politics. For outdoor exercise some hunting and fishing, plus five active grandchildren! Occasionally I run into some 1915ers, but our ranks are thinning. Best regards to you and Fran; hope we'll meet some day soon." . . . **Phil Alger,** Schenectady: My oldest grandson is a junior at Harvard, and a granddaughter is slated to enter Radcliffe next fall. There are seven younger ones coming on, so perhaps one or more will go to M.I.T. in due time. At any rate we expect to maintain educational connections with Cambridge for quite a few years, and so to keep up acquaintance with Tech goings on. My most esoteric activity recently has been as chairman of an ECPD subcommittees charged with revising the canons of ethics for engineers that D.C. Jackson put in shape some 20 years ago. Ethics are becoming more and more important in professional life, so we hope to give the canons new life and meaning. My mathematics book will come out in paperback this summer, as will a new edition of my book on induction motors. With my RPI students and many hobbies it seems that time moves along more rapidly than ever." . . . With a winter picture of a huge tree, with many branches resting quietly in a deep snow bank, **Doug Baker,** East Middlebury, Vt.: "I am sorry I can't save the work on this tree, which had to be cut down because of Dutch Elm disease, until you come up here next summer, as you would enjoy the exercise." No thanks, Doug, I'll concentrate on Elizabeth's chicken in white wine and blueberry pie, when we are up there. . . . **Joe Barnwell,** Columbia, S.C.; "Since resigning my job as head engineer for the South Carolina State Highway Department some 28 years ago, I have been running my own contracting business. Most of my contracts have been building bridges for the highway department and railroads in this state. We have three daughters, all happily married, and six grandchildren, two boys and two girls plus a couple of prospects. I have no idea of retiring as long as I am able to work and get work."

Orton Camp, Middlebury, Conn.: "I have not retired, but am working full time at Platt Brothers and Company. I am glad to report that after six years in the red as a result of the flood eight years ago, we are now back on our feet and are enjoying reasonably satisfactory business when you consider the very competitive situation today, both from domestic and foreign sources. My family are all fine. Miriam and I live in Middlebury with no children with us at the present time. Two of my children live in adjoining towns and one is teaching school in Washington, D.C. She is trying to teach that two plus two still make four to some of the children of the New Frontier officials in Washington." With that arithmetic down there? . . . **Bill Campbell,** Manchester Depot, Vt.: "How's your conduct? When are you coming up to look things over? Sugaring will start pretty soon. I don't know how Fran stands you." Well, I guess Fran is somewhat puzzled herself, at times. Recalling that freezing weekend we had up at Bill's place last April, we will wait for a warmer time, maple sugar or no. . . . **Harvey Daniels,** Del Ray Beach, Fla.: "It's nice to hear from you. I enjoy the class notes in The Review and thank you for your unfailing efforts to keep those interesting notes coming along. I have been retired for the past 10 years or more, and after spending our winters in Florida for some years we decided to make Florida our permanent home. We have settled in Delray Beach. My wife and I enjoy our fine beach and also are golfing enthusiasts, playing regularly. With kind regards and best wishes to you and to other old friends and classmates."

Here's a new twist on "Help." **Reggie Foster,** writing for the famous Lowell twins: "I hope this little contribution will help to keep our good old secretary solvent. What do you mean asking fellows like **Chet (Runels)** and myself if we are retired. What is that? He and I are the only working fellows left from what I read in The Review. The motto now is "help Chet and myself." It is good to hear from you, and we send our best to you all." . . . We all should remember **Harold Hadley,** captain and right half-back on our winning freshman football team. After no word of him in all these years, it's wonderful to have this delightful letter from him, in Worcester, Mass.: "As you know I transferred to Tufts after one year at M.I.T., graduating in the Class of 1915. I therefore have been much more active in my Tufts class and also the college than at M.I.T. After graduating I was in the Army in France for two years serving in the 2nd and 28th Divisions. I came out a captain of engineers. I served as vice-president and general manager of a group of ice and oil companies in Massachusetts, New Hampshire and Maine. I then started my own oil business in Worcester. I sold my company three years ago and retired. I live in Worcester and spend six months of the summer at Orleans on Cape Cod. I have a boat and spend a lot of time fishing, also have a small flower garden. It does not take much to keep me busy. I have 4 children, 10 grandchildren and 2 great-grandchildren. Best regards to you and the class."

Seward Highley, Boston: "Helen and I are quite healthy, due no doubt to our hard work on this retirement business. It takes all day each day to accomplish what we set out to do—'nothing'." . . . Writing for **Bill Holway,** Tulsa, Okla., Mrs. Hope Holway: "Tomorrow morning we leave on almost the first vacation in 40 years—going to drive to Tucson, Ariz. We have had a most busy winter, and our two sons will carry on while we are gone. Don ('47), our oldest, has charge of all electrical work involved in the construction program of the Grand River Dam Authority and Bill ('43) is in charge of all the other work. They are both M.I.T. men. Right now we are building our second big dam on the Grand River, Markham Ferry. Coming up over the horizon may be a dam in Nigeria. Bill made a trip there last summer to look over the prospects, but nothing has as yet developed. He was much impressed with the country, its people, and all its possibilities, but they have a way to go. Hard work seems to agree with us all, and we stay very well. We have our house up on the Lake, about 90 miles from Tulsa, and we go up there almost every weekend. We sold our cattle in the spring and rented the ranch, so there is one less batch of paper work to do. Right now we are using the quiet hours up there to write the 'History of the Grand River Dam Authority,' which is going to be a tome."

Harry Murphy, Boston, with a big check: "Here's my 'chit' to 1915 plus a low estimate of what my large family eats and drinks at our annual Class Cocktail Party. I am still working six days a week and accomplishing progressively less. My best to Fran and you." Now, that, Harry, is too severe. His charming Lucy and the family are the attractive life of our party every year. Keep coming. . . . **Boots** and Helen **Malone** tantalize us with a reminder to join them on a walk on the beach at Siesta Key in Sarasota. But, Boots ends it by saying it has been too cold to swim. . . . **Bob Mitchell,** Springfield, N.J.: "Having passed the 70th birthday, I retired last October to give more freedom of action to my understudy, who has been my faithful, loyal, and capable helper for 30 years. He has well earned the right to it. But I cannot say that I find doing nothing is attractive. So I do a little consulting work and fill in with fishing, boating, golf and garden. I have two sons-in-law who are professors at Cornell and who are yacht racing enthusiasts (Star Class), so I get some good sailing with them, and occasional enjoyable contacts with campus life. My grandsons are now getting big enough to take off on fishing trips. Had two of them in Maine last summer to initiate them to dry fly fishing. Winters we spend in Florida, but this winter has been so cold I haven't fished here once."

More of these splendid letters next month. Dix Proctor, '17, was in Boston in February for a check-up at a hospital here and with Ray and Katherine Stevens, '17, visited with us one evening. Later, Fran and I went to see him at the hospital. He is all right and ready to take off in May for a North Cape cruise. . . . Bridge Casselman, X, was visiting his son, Bob, '39, here in March and called us for a nice long phone talk. Good to hear from you, Bridge. . . . Professor **Walter H. Brown** died in August, 1962, in Palo Alto, Calif. . . . **Philip O. Keeney** passed away December 19, 1962, in New York City. . . . See you at the Class Cocktail Party, Monday afternoon, June 10, M.I.T. Faculty Club, Cambridge.—**Azel W. Mack,** Secretary, 100 Memorial Drive, Cambridge 42, Mass.

'16

Our President, bloody but unbowed, opens our column this month with this surprising news item: "It was a long

winter for everyone but it has been an even longer spring for me. Since March 16 (is this the luck of the Irish?) when I cracked my left ankle in a skiing mishap, (fortunately there was no displacement) I have been hobbling around on crutches. Perhaps the only good thing I can say about this is that it happened sufficiently far enough in advance of our reunion so that by reunion-time I will have had enough practice with the crutches so that if they are still necessary I will be able to get around pretty well at the Oyster Harbors Club. And, certainly be in better shape than usual to maintain order. Mrs. Fletcher and I have been looking forward to this reunion as I hope many of you have and we'll be seeing you then, June 7, 8, and 9, 1963, at the Oyster Harbors Club, Osterville."

On display at the reunion will be a most interesting little booklet "Irish Fox Hunt" by an author we all know well, **Walt Binger.** Inside is a picture of three fine looking gentlemen of the Fairfield County Hunt, our Walt for one—picture appears under a large headline: "Hunting with Galway Blazers" on the front page of the Irish Independent, Dublin, March 11, 1959. In a foreword, the author says: "This story was bought and paid for by 'Sports Illustrated.' When later it had not been published I offered to buy it back. They very kindly gave it to me. In an expanded and more intimate form it is here privately printed for my friends, foxhunting and other." A fascinating account—don't miss it at the reunion. . . . **Joe Barker** finds his NASA consulting very interesting and intriguing (as did your secretary in 1962) but he has to sort-of fight against spending more than 8 to 10 days a month at it. On April 9 he was to take off for Langley, Va., to spend three days at the research center there; in March he spent three days at Lewis Center in Cleveland and three at Canaveral for a "shoot." As we write, he and Mary are planning to go to Idaho late in April for three weeks "to visit Jack and Marilyn. He has been assigned from flying to a missile command, and has a 'flock of birds nesting in silos.' Every three days he lives in the concrete command post, then three days at home. But he has leave for the time we will be visiting."

It seems shocking but that's the way it is; '16ers find themselves the items of comment in news-bits headed "Fifty Years Ago"! A recent one in Lowell, Mass., was one of these—no, not so very recent, but nearly a year ago, dated May 21, 1962. It reads: "The 31st annual field day of Lowell High School (in 1912), held at Spaulding Park (now Alumni Field on Rogers Street) attracted a record crowd. The boys brigade and the girls regiment walked all the way to the park after their downtown parade and rated long cheers for their efforts. The brigade was under the command of Colonel Arthur J. Kerrigan, Lieutenant Colonel Lawrence F. Safford and Major **Ralph Fletcher.** A feature of the program was a May pole drill by the girls." How about that? No doubt about it; Ralph was up front way back there too!

Jim Evans had another hospital stay in March, for five days following an operation, not serious—but we regret to report that complications have just set in (April 10), and he is back in the hospital. He has been loud in his thanks for the many letters and cards he has received from classmates. Some of the following items come from letters to "Uncle Jim." The **Don Websters** in March spoke of being "settled-in" Bermudians "with our little daily routines, just living along in our housekeeping cottage. Lunch out generally, all over the island, a different spot each day. Spring weather here, not Caribbean hot, temperature about 55-70 degrees —we love it. . . . Hope to see **Emory Kemp** if he comes to the Cape, to see how he liked summer Florida living. Not for us!" The **Leonard Stones,** as frequent Caribbean travelers (a six-weeks trip in February and March) might most respectfully say something like "Watch your language!" on this weather business, for they claim much comfort in the Caribbean: "not hard to take, I did some scuba diving —half an hour 30 feet down among the fishes and coral—quite a thrill!" . . . And the **Steve Brophys,** after five weeks in Jamaica, sing the rosiest praises of this island south of Cuba. Steve can give some pretty convincing details if you want them. He, on return early in April, was the picture of health, a choice bit of advertising copy of "what Jamaica can do for you!" . . . **George Petit** tells Jim Evans that he hopes to make the 47th Reunion, that he keeps fairly well "but age, now and then, begins to creep up on one, and to get oriented I am going into the back yard tonight and explode a few firecrackers." . . . **Hy Ullian** to Jim: "Some little bird told me. Hope you are well on the way to recovery. I, and all the other members of the class, will be looking forward to seeing you at the June reunion back in your usual peppy form." . . . And advice from **Stew Rowlett:** "These martinis get kind of heavy at our age, and we should avoid lifting heavy objects. Now I lift mostly bourbon—it's lighter—or is it?" **Bill Leach** reported that he hadn't quite recovered from his siege of last year but drives and gets out in the garden. Then: "At this time, I do not know if I will make the annual reunion. It is the 50th Reunion of the University of Chicago Championship Football Team. There are only five of us left, not counting Amos Alonzo Stagg. However he will not be able to make it." . . . **Ed Weissbach** indicated to Jim what some of the problems are for a minister of the gospel (Ed is rector of Christ Church, Somerville), including raising funds for such items as painting the outside of a church and repairing the woodwork. . . . And **Charlie (Mac) McCarthy** notes that the theory of "sets," that Jim talks about in his substitute teaching in the Paterson (N.J.) High School, is too much for him; he throws in the sponge unless someone gives a special course of instruction.

Francis Stern had a winter of pretty steady golf in Palm Springs, Calif., we understand, except for two things: exceedingly cold weather in January, and some kind of flu-bug for the last week-and-a-half before coming home to West Hartford the last day of March. The cold spell in January was the coldest in 50 years: "many of the flowers and much of the shrubbery was frost bitten, for the temperature went down to 20 one night and to 28 for four or five nights in a row. However, beginning about the 22nd of January, it started to warm up and the month of February has been just about ideal." Francis reports return postcards from three of the traveling '16ers—the Don Websters, the Steve Brophys, and Elsa and Ed Mueser in American Samoa. We might note parenthetically that only last week (April 4) we enjoyed the company of Ed Mueser on a bus ride to New York, and heard more interesting details of the trip that Elsa and he took to New Zealand, Australia, and some Pacific Islands. Should anyone want suggestions or advice on where to go and what to see down-under, write to Elsa and Ed (E.E.Mueser, Mountain Lakes, N.J.)

Dave Patten joined the Temporarily-Laid-Up Club on February 27, with an above-the-ankle broken right leg when he slipped "and collapsed on a three-foot patch of ice outside my own door, sober as a judge, at 8:30 in the morning. Suffice it to record that three days at the MGH had the injured member firmly plastered from knee down with two pins through my shin bone and an anchoring pin through the heel. No pain, for those who come after me. And perhaps the satisfaction of a complete physical which found nothing and gave a blood pressure of 120. I'm thinking of applying for temporary duty aboard the U.S.S. Nautilus." Dave says his mistake this year was not hightailing it to California this winter. Then: "I ran into **Don Webster** and his charming bride at the museum one day last November, and Mrs. Patten talked with some neighbors of ours who met them in Bermuda this winter with the comment that there was no better dressed or more attractive couple on the island. And that goes for those in the 1916 46th Reunion snapshot, the ladies particularly." . . . **Bill Drummey**, in his get-well letter to Jim Evans, notes that "While all my plumbing is yet intact, I have been hospitable to 'flu' bugs since last November in re-occurring bouts of decreasing intensity. That, plus an incurable disease—known as '69'— dims my beauty a wee bit." Bill says that on January 2, 1964, he will no longer be a senior partner of Drummey, Rosane, Anderson; Architects, Engineers. Some of his contracts cannot be completed in '63 so there will be things to work out. Says: "I'd like to work from Tuesday noon to Thursday noon. Now it is Monday noon to Friday noon. We are running 26 commissions currently, of which 10 are for the incarceration of Little Monsters—commonly called schools. It is contentious." All we can add is: Can you imagine Bill not working? Don't try! . . . In a stopover at Dallas Airport early in March, we chatted with **Mark Lemmon** on the phone, and are hoping, with **Steve Brophy,** that this is the year that Mark will be with us at a reunion. And speaking of Steve, he, as a member of the M.I.T. Corporation, is to represent M.I.T. at Barnard College on April 22, at the Inauguration of Rosemary Park as president. We couldn't be better represented!

Mrs. **Ernest Gagnon,** in expressing appreciation of 1916's messages of sympathy, writes that she found the following in Ernest's notebook: "The work done by M.I.T. is pre-eminently important for defense and scientific progress, and so badly needed by our country; and this training of scientists and engineers is its greatest work. My training there was the greatest factor in increasing earning power, and there I learned to use whatever ability I have." Also, in reference to our departed friend Lobby, '17, we are pleased to note a word of appreciation from Mexico from Conchita (Mrs.) Lobdell for the classes' letter of condolence. . . . **Charlie Lawrance** reports a successful follow-up operation at MGH in March: a repaired artery system in his right leg. He notes with pride that his doctor is none other than Dr. Robert W. Shaw, '42, who some time ago "made a world-wide stir and record by stitching a boy's arm back on." . . . **Aime Cousineau,** at 77, keeps well and busy; moreover he's a dependable for answering letters! Last fall he visited across the western provinces of Canada from The Pas to Victoria. He also attended the World's Fair in Seattle. His last visit in 1911-12 was in the capacity of an assistant Dominion Land Surveyor (D.L.S.). He studied sanitary engineering from 1914 to 1916 at Tech and Harvard, and was with the City of Montreal from 1914 to 1955 in the Health Department and the City Planning Department. . . . **Dick Berger** continues active too in his Bridgeport, Conn., work as president of Cancer Prevention, Inc. In an article "Cancer Fighters Challenged by Bridgeporter on Methods," he "challenged the effectiveness" of leukemia and cancer societies that "are engaged in a difference of opinion on their respective fund campaigns in Bridgeport." On April 1, Dick gave a talk on cancer to the Rotarians in Norwalk, Conn. According to the April 2 issue of the Bridgeport Post: "Radiation from fluroescent lighting, X-ray, and television is the unpublicized cause of increased cancer, it was claimed by Richard G. Berger, President of Cancer Foundation, Inc., in his talk, 'Cancer, Why?' at a meeting of Norwalk Rotary Club."

Back in January, the Boston Morning Globe had an "All Sorts" story by Joe Harrington on the subject, "When Volcano Spewed Lava on Nantasket." The story is about rock-hounds and about **Tom McSweeney** of Hingham in particular. As the article notes: "For quite a few years now the McSweeneys have specialized on 'gem stones' which, they explained, are any specimen that is attractive because of its color or pattern. It is made into a piece of decorative jewelry, such as cuff links or a lavalier. When the McSweeneys return from a vacation-collecting trip the springs of their car are riding very low." As we recall, our other famous rock-hounds, the **Vertrees Youngs** of Bogalusa, install extra-heavy springs in their car when they set off on a rock hunting expedition in the West; so it must be a real problem! . . . From Winston-Salem, **Arvin Page** sends us a clipping that reads like this: **"Frank Ross** wonders at all the fuss about the walking craze: 'I always walk home from Las Vegas.'" And Arvin adds: "It's a long walk from Las Vegas to West Hartford. Why don't you tell Frank to let you know when he is going to Las Vegas so you can take up a collection to provide carfare home." There was only one thing for us to do; send all this material to Frank down in Naples, Fla. Do you want to know how Frank replied? Of course you do, so here it is: "You tell Arvin Page I've never been there but if and when I go I plan to give my wife some 'mad money' to get home on after I get cleaned. As for walking I can't help being amazed at a guy in a rocking chair 'conning' hundreds of folks into walking 50 miles or more. I'm still doing my walking on the golf course and I guess I average about 35 miles a week, and I don't plan to do any more for any Democrat or Republican either."

Cy Guething reported late in March their return to Birmingham, Mich., from Pink Sands: "and mighty glad to get home for it was getting too warm for an old New England farmer down there after early March." He is immensely pleased that the 47th is to be at Oyster Harbors Club and adds: "It may not be too long before we shall have to select a location which has ramps instead of stairs. Don't forget to bring your swim suit and join me in that morning swim." Brr-rr-rr!!! . . . **Ed Weissbach** tells of the trip he and his wife enjoyed in Europe: "We had several weeks in London and then flew to Athens where we went on a cruise of the Greek Islands in the Aegean Sea. I expect we got to all the sites that Saint Paul visited. You know I did not realize what a dry and burned-up place the Near East is. We have always read about shepherds, but those countries really have them. At Philippi they are still excavating and sift the dirt as they dig into the debris. At this place they have the old 'community' lavatory (john) exposed and I got some good slides of it. The toilet seats are stone—a bit cold no doubt, but at that they are more modern than the foot-pads that were the conveniences in Troy. . . . While in England we went by train to King's Lynn to see some of my old Camden friends who are with the Campbell Soup plant there. I was anxious to visit there because you may remember that six years ago I was in England helping to get this plant started; that was when you phoned me at the London office." On their way back from Athens, they had several days in Amsterdam. "In Amsterdam we stayed at the small hotel which my aunt used to operate years ago. It was not only small in size but in room area as well—only room for one at a time to dress. In the museum I ran into the rector of our Episcopal Church in Duxbury."

The **Irv McDaniels** started on a long trek home from Malaga, Spain, on April 24—a trip that will last until October 29, sailing from Genoa on September 26. But such a trip: Normandy, England, Scotland, Wales on an 18-day bus trip; Austria; grand deluxe bus tour of Czechoslovakia, Bohemia, Moravia; Hungary, Rumania, Bulgaria, Greece with advance reservations at all hotels "as the present booking indicates that this will be the biggest madhouse of American tourists Europe has ever seen." We just hope Irv will continue writing impressions of his travels so we can include what we feel you would want us to include in the class column. Their mail addresses: June 26-29, Hotel Baglioni Palace, 6 Piazza Unita Italiana, Florence, Italy; July 15-18, Hotel Europa, 1 Neuer Markt, Karntnerstrasse, Vienna; August 31, King's Palace Hotel, 4 Venizelou Ave., Athens. Writing in March, Irv says: "You will never guess what else we are doing—making this year's Christmas cards. The primary reason is financial; we don't dare write you how much money we save. Also we will be so busy when we get home we wouldn't have the time to do them. So, when we are sailing home in the South Atlantic in our shorts, sipping cooled drinks under a tropical sky, imagine us painting and painting and painting." . . . **Herb Gfroerer,** in Hamden, Conn., speaks of a hectic winter and a delay in their usual visit South. At the end of March when taking their younger son back to school, they stopped at their summer place in Rowe, Mass. They couldn't find their mailbox; it was still buried in 4 to 6 feet of snow. And here's something that piqued our interest: "The boys want me to record my five-year contact with Sir Winston Churchill, and how we helped him in writing his history of the Second World War. Maybe I'll find time this summer in the Berkshires." . . . Before closing the column we must record the attendance at the New York April 4th monthly luncheon: Messrs. Barker, Brophy, Mendelson, Stone, Dodge, and at the same table for 1917: Messrs. Aldrin, Brooks, Loengard, Proctor, Morton (and Joe Littlefield looked in). We have an excellent travel account of the **Harold Grays** in 1962; if you'd like to read it just let us know; also Sylvia **Young's** "The Young Safari Letters" is still going the rounds. **Pete Mahlman** is now reading it; just send us a card if you want to read it. We have an interesting story from **Nat Warshaw** for the July column, and a good picture of him for the reunion bulletin board. Remember the time and place: June 7,8,9 at the Oyster Harbors Club in Osterville. Bring any pictures or clippings you want posted there, and of course keep the bits of news and philosophy coming in for the column.—**Harold F. Dodge,** Secretary, 96 Briarcliff Road, Mountain Lakes, N. J.; **Ralph A. Fletcher,** President, Box 71, West Chelmsford, Mass.

'17

As these notes are being written (April 7) 12 members of the class (11 with wives) have made reservations for the pre-Alumni Day reunion at Sturbridge from June 7 to Sunday, June 9. We will give you a report in the first fall issue of The Review in November. . . . Notice has been received of the death of **Paul A. de Mars** of Belmont, Mass., on March 14. After two years in the Army, from 1917 to 1919, he returned to M.I.T. from 1919 to 1920. His S.B. degree was in electrical engineering. He was employed by the

New England Telephone and Telegraph Company as engineer from 1920 to 1927 and was professor of electrical engineering at Tufts College from 1927 to 1931. He later became technical director and then vice-president of the Yankee Network. In 1942, he was called into active duty in the U.S.N.R. in connection with the guided missiles program of the Bureau of Aeronautics and Chief of Naval Operations. Later he designed and built radio and television stations.

Our theme for next season's class notes will be "What did you do on your 1963 vacation period away from home?" Please be prepared to share with classmates your interesting vacation experiences. . . . In previous issues of the class notes we have noted the retirement activities of members of the class as recorded on the recent questionnaire. In this issue, we will present the activities of those who have continued in active employment. . . . **C. C. Adams,** Providence R.I. is a chemist on special investigations concerning bleaching, mercerizing, dyeing, printing and finishing cotton piece goods for Fruit of the Loom, Inc. . . . **J. J. Basch,** Philadelphia, Pa., is concerned with chemical engineering management for Oakite Products, Inc. . . . **Rudy Beaver,** Waltham, Mass., continues as owner and manufacturer of a surgical instruments Company. . . . **Dud Bell,** Bristol, Pa., is continuing indefinitely as a manufacturer's agent for outdoor furniture, toys, and allied lines. . . . **Stanley Chisholm,** San Diego, Calif., continues as station materials engineer at the U.S. Naval Air Station, San Diego. . . . **Enos Curtin** continues his many business consulting activities and directorships in New York City. . . . **Barney Dodge** is looking forward to another year as dean of Yale University's Department of Chemical Engineering. . . . **Bob Erb** has from two to four years more as president of Melville Shoe Company, New York City. . . . **J. C. Flaherty,** Dedham, Mass., is active in the church architecture field. . . . **Ray Gauger,** St. Paul, Minn., operates his own architectural office with the help of his sons. . . . **Foster Harlow,** Milton, Mass., maintains an office as a General Insurance broker. . . . **John Harper,** Patterson, N.Y., operates his own petroleum distributing business. . . . **Arthur Keating,** Hyannis, Mass., is active in education.

Robert Mulliken, Chicago, Ill., professor, University of Chicago, is concerned with research in physics and chemistry. . . . **Bill Neuberg,** New York City, makes and sells mildew preventatives. . . . **L. I. Noyes,** Ironwood, Mich., is a newspaper publisher. . . . **Frank Peacock,** Wilmette, Ill., is a consulting engineer. . . . **K. Richmond,** Brooklyn, N.Y., is vice-president and treasurer of Abraham and Straus Division, Federated Stores, Inc. . . . **C. B. Sawyer,** Eastlake, Ohio, is president, Sawyer Research Products, Inc. . . . **C. K. Seely,** Madrid, Spain, is on assignment in Madrid for Gibbs and Hill Inc, N.Y., as a consultant in connection with Central Station Design and Construction to the Spanish Authority Instituto Nacional de Industria. . . . **Haig Solakian,** Branford, Conn., is in the business of manufacturing heat-treating furnaces and salt baths. . . . **G. H. Stebbins,** Bellevue, Wash., is manager and part owner, Ship Repair Yard. . . . **Rad Stevens,** Elgin Ill., is vice-president and packaging machinery consultant for Doughboy Industries. . . . A wealthy industrialist was taken to the hospital. Because of a room shortage, they had to put him temporarily in a private room in the maternity ward. Being in some pain, he asked the nurse if he could have a drug that might induce sleep. "No," said the nurse, "that drug is only for labor." "What!" he exclaimed angrily. "Don't you have anything for management?"—**W. I. McNeill,** Secretary, 107 Wood Pond Road, West Hartford 7, Conn.; **C. D. Proctor,** Assistant Secretary, P.O. Box 336, Lincoln Park, N.J.

'18

It is a tense and hope filled time. Tense because a submarine has just been lost with all on board. Hope filled because today is Easter. The ice has just gone out of the pond as the south wind came in, and the promise of another spring is everywhere. The brooks are singing with pounding water that leaps the rocks. The smell of moist humus fills my woods. Partridges eat the buds high up on the maples, and by the time you read this our 45th Reunion will be upon us. A letter from **Pete Sanger** says, "I happened to be staying in Osterville for a couple of weeks two summers ago. When I had a chance to look in at the Wianno Club I liked what I saw and inquired as to what arrangements could be made for us, especially after learning that other M.I.T. reunions had been happily held there. But there was a slight catch. Any such group must be sponsored by a member of the club. So I communicated with **Johnny Kilduff** to see what could be done. Always acting the top executive, he forthwith appointed me reunion chairman, and gave me the job of working out the details. As for a sponsor, I discovered that an old advertising client of mine, now retired and living at Oyster Harbor, was happy to take that responsibility. Once that was out of the way, the other details got attention while I was at home trying to get my strength back following an illness. I hope to be back in the office by the first of April and will then get the ball rolling on such items as reservations. As a result of last year's preliminary check up I anticipate well over 100 of us —boys and gals. I'm sure they will all enjoy everything." . . . It is also a tense and hope-filled time for the loved ones of **Herbert F. Jermain** (electro-chemistry), who died on March 25 in Teaneck, N.J., where he made his home.—**F. Alexander Magoun,** Secretary, Jaffrey Center, New Hampshire.

'20

As many will recall, particularly the Course X men, **Foster P. Doane, Jr.** and **Foster B. Doane** were both members of our illustrious class, the latter obtaining his master's degree in 1920. Foster P., Jr., is the very active vice-president of Bergstrom Paper Company, Neenah, Wis., and a man of prominence and distinction in the paper industry. Foster B. was co-founder and former president of Magnaflux Corporation and president of the F. B. Doane Foundation, prior to his death in February. Foster Baird Doane had an illustrious career. In 1929, when connected with the Pittsburgh Testing Laboratory, he entered a partnership with Professor de Forest of M.I.T. to develop a completely new technology for nondestructive testing of materials by use of magnetic particles. Out of this came the Magnaflux Corporation, the world's largest for nondestructive testing systems covering a wide range of materials. He was awarded honorary degrees at Bethany College and Allegheny College and was a trustee of Allegheny. His major interests outside of business centered around a 3,500-acre ranch near Bandera, Texas, where he had a considerable number of fancy livestock—cattle, sheep, Angora goats and horses. He was a noted sportsman and world traveler, a director of the McNay Art Institute of San Antonio, a painter of prowess, exhibiting his own work and that of famous artists in the Frontier Times Museum which he owned. He set up the Doane Foundation Scholarship Fund for Bandera high school students to attend college, and financed the rebuilding of the Bandera Library.

Lee Thomas thoughtfully sent word of the death of **Harry Taylor,** who had left his home in Philadelphia to spend the winter months in Arizona and who died in Yuma last March. He had planned to live in Yuma and was supervising the construction of a new home there prior to his final illness. Harry (**Merritt H.**) was chairman of the board of the Philadelphia Suburban Transportation Company which operates the Red Arrow Lines. His son, Merritt H. Taylor, Jr., is president of the Red Arrow Lines. Starting as an engineer with Thomas A. Edison, Harry shortly went to work as a trolley conductor for the Philadelphia and West Chester Traction Company headed by his father. Later he succeeded his father as president. He served as a War Department transportation consultant and as chief of transportation for the Allied Commission in Italy during World War II. He was a former director of the Texas Public Service Company, People's Power and Light Company and Great Lakes Utility Company and a former president of the Allied Gas Company of Illinois. At the time of his death he was president of the Pennsylvania and Southern Gas Company and a member of the advisory board of the First Pennsylvania Banking and Trust Company. He was a member of the Merion Golf Club, Racquet Club and the Society of the Cincinnati.

Lee Thomas also mentioned his visit to **K. B. White** at K. B.'s chateau in Arthies near Paris. Says Lee; "on our way back to Paris, our driver told me he had been circulating in the village, picking up gossip, and that our friend, Mr. White, was a very important man." How important has been reported in these notes

more than once. Lee himself retired last year when the several companies he owned and operated were sold to Baldwin-Lima-Hamilton Corporation. Lee's Hamilton-Thomas Corporation of Hamilton, Ohio, had as subsidiaries, C. H. Wheeler Manufacturing Company and Griscom-Russell Company, a principal supplier of sea water distillation units. Lee is presently to be found at Thomas and Company, Broad and Chestnut Streets, Philadelphia. . . . **George Burt** is now in Flossmoor, Ill., address 1648 Western Avenue. . . . **Willard Riddell** is in Hamilton, Ontario, address, 12 Auchmor Road. . . . **"Dode" Spiehler** is in Evanston, Ill., address 1632 Ashland Avenue. . . . **Albert Tomlinson** has left Upper Montclair, N.J., and resides in Pinehurst, N.C. . . . **L. D. Wilson** has moved from Rye, N.Y., to New Rochelle, address 983 North Avenue. . . . Hope to see a goodly turnout of '20 men on Alumni Day.—**Harold Bugbee,** Secretary, 21 Everell Road, Winchester, Mass.

'21

In just a few days, you will have another opportunity to gather with others of the Class of 1921, their wives and guests at the most enjoyable sessions on campus in Cambridge which mark the annual Alumni Day. Monday, June 10 is the date, and the program is jampacked with interesting items for all of the family. In the morning: the M.I.T.-developed inertial navigation technique which will guide the Apollo astronauts to the moon; the M.I.T.-developed man-computer team, whose instantaneous computations compress years of laborious design into minutes; the fabulous maser, the brainchild of Provost Charles H. Townes; the eight megawatt M.I.T. National Magnet Laboratory; specialized hardware used in orbital flights; luncheon at noon in the Great Court, where '21 will congregate to hear the always amazing summary and forecast by our revered President Jay Stratton, '23. In the afternoon: the Humanities Department on parade—visual arts, poetry, music appreciation and understanding, to develop intellectual curiosity. Then the relaxing hour on Briggs Field, followed by the banquet in Rockwell Cage, where speeches are taboo! The big finale is the brilliance of Arthur Fiedler and the Boston Pops right next door in the comfort of the well-designed seats and perfect acoustics of Kresge Auditorium. You and your lady will have a grand time. We all want to see you.

Arthur G. Wakeman of 130 Limekiln Drive, Neenah, Wis., has retired as vice-president of Kimberly-Clark Company of Neenah. He is continuing to serve as a director and will act as consultant for the company. His new office is at 221 E. Wisconsin Avenue. Art has made his home in Neenah since 1957, when he was recalled to Kimberly-Clark from Alabama, where he had been president of the Coosa River Newsprint Company, a division of Kimberly-Clark. A native of Wisconsin, he was associated with the V. D. Simmons Company, paper mill architects, following graduation from Technology in Course II. He was also with Beloit Corporation before becoming assistant superintendent of the Kimberly mill. In 1925, he joined the Fox River Paper Company of Appleton, Wis., where he advanced to general manager and director. When the United States entered World War II, he went to Washington in the pulp and paper division of the War Production Board, later heading the division. He was named a member of the Mission of Economic Affairs and also served the government at the U. S. Embassy in London and on a special assignment in Germany. He joined Kimberly-Clark when he returned to Wisconsin in 1945. In 1948, when the Coosa River organization was formed, he became a vice-president and moved up to become president and then chairman. He is a member of the Technical Association of the Pulp and Paper Industry and director of the Southern Research Institute and of the Royal Crown Cola Company.

Busy members of the Class of 1921 seem to be able to find time to carry out various duties associated with the Alumni Association of M.I.T., as evidenced by the numerous entries in the new directory of the Association. **Joe Wenick** leads off in the early pages as a member at large of the Alumni Council and of the National Nominating Committee. **Chick Kurth** is our Class Representative on the Council. Others, who represent local M.I.T. clubs, include **Mich Bawden** serving Cleveland; **George Chutter,** Northern New Jersey; **Josh Crosby,** Bangor, Maine; **Frank Kittredge,** Monterrey, Mexico; **Ace Rood,** Indianapolis. The officers of the Class of 1921 are: **Ray St. Laurent,** President; **Irv Jakobson,** Vice-president; **Cac Clarke,** Secretary-Treasurer; **Ted Steffian,** Assistant Secretary; **Ed Farrand** and **Larc Randall,** Class Agents; **Bob Miller,** Photo-Historian; **Mich Bawden,** Special Gifts Chairman; **Mel Jenney,** 45th Reunion Chairman. Alumni Representatives on Departmental Visiting Committees, nominated by the Alumni Council and elected by the M.I.T. Corporation, are currently: **John Lee** for Mechanical Engineering; **Fred Adams,** Chemistry; **Andy McKee,** Naval Architecture and Marine Engineering. **Charlie Manneback** heads the list of local club officers as the president of the M.I.T. Club of Belgium in Brussels. **Wally Adams** is secretary-treasurer of the M.I.T. Club of the Miami Valley, Dayton, Ohio. **Joe Wenick** triples in brass as the perennial treasurer of the M.I.T. Club of Northern New Jersey. **Tom Card** is president of the Technology Club of New Bedford, Mass. The Educational Council is constituted of Honorary Secretaries (HS) and Educational Counselors who are: **Sam Lunden** (HS), Los Angeles; **Ray St. Laurent** (HS), Manchester, Conn.; **Ed Farrand** (HS), Leesburg, Ga.; **Harry Field** (HS), Honolulu, Hawaii; **Cac Clarke** (HS and Regional Chairman), **Sumner Hayward** (HS) and **Joe Wenick,** New Jersey; **Irv Jakobson** (HS and Regional Chairman), New York; **Ray Snow** (HS), Raleigh, N.C.; **Wally Adams,** Middletown, Ohio; **Si Freese** (HS), Fort Worth, Texas; **Gene Rudow** (HS), Seattle, Wash. **Warrie Norton** is on a distinguished list—past presidents of the Alumni Association.

With the younger set, we note that Alexander E. Halberstadt, Jr., '46, son of the late **Alexander Halberstadt,** is an Educational Counselor in Akron, Ohio, and that John W. Barriger, '49, son of our **Jack Barriger,** is assistant treasurer of the M.I.T. Club of Southern California. . . . Pretty Mrs. Howard B. Tuthill, Jr., daughter-in-law of **Howard B. Tuthill,** appears in the society pages, briefing a bevy of Junior Leaguers. . . . Excerpts from an article on Jamaica, appearing in "The Glen Ridge Saver" of our local savings and loan association: "The elegant place this winter seems to be the San San section in the northeast corner of Jamaica, not far from the village of Nonesuch. . . . There is at least one American on the grounds. Robin Moore, son of **Robert E. Moore,** Chairman of the Sheraton Corporation of America, has taken up residence on a hillside looking down into an incredibly blue lagoon. He is turning out books and plays. One play is up for Broadway." . . . **Romney J. Mellen** gives his home address as 4429 Buckingham Drive, El Paso 2, Texas. . . . When **Ray** and Helen **St. Laurent** are not at their summer place at Vinalhaven, Maine, they can be reached at home at 47 Gerard Street, Manchester, Conn. . . . **Douglas Weatherston** reports a business address at 1817 National Bank of Commerce Building, San Antonio 5, Texas. . . . Mail for **Clayton C. Westland** should be addressed to 7 Lockwood Road, Scarsdale, N.Y.

It is with heavy heart that we record the passing on March 16, 1963, of **Lincoln Barrett Barker** of 883 Lisha Kill Road, Schenectady 9, N.Y., and extend to his family the sincerest sympathy of the entire Class of 1921. Born in Canisteo, N.Y., on March 28, 1898, Linc attended the Huntington School in Boston and prepared for Technology at Phillips Exeter Academy. He received his bachelor's degree with us in Course II and returned to the Institute from 1928 to 1930 to obtain a master's degree in metallurgy in Course III. A metallurgist in the Materials and Processes Laboratory, Large Steam Turbine Generator Department of the General Electric Company, and a resident of the Schenectady area since 1929, he had planned to retire on March 28. At Technology, Linc was a member of Theta Delta Chi, the Mechanical Engineering Society, Masonic Club, Freshman Tug o' War Team, News Staff and Circulation Manager of "The Tech." During World War I, he was an apprentice seamen in the S.N.T.C. at the Institute. In view of Linc's modesty in rarely writing about himself, we asked Mrs. Barker for aid in preparing an account of his activities following our graduation. We are so appreciative of her warm and gracious letter that we are taking the liberty of quoting it: "Your kind letter just came, and I am deeply grateful for the expressions of sympathy. At the moment I can think of nothing that you can do, but thank you for offering. I am enclosing a newspaper account but it is not complete; everything happened so suddenly that I was unprepared. I shall try to complete the article for you and get it in the mail today. First of all, here is what

Linc's associate and immediate superior sent me when I asked for a description of Linc's work: 'Following his graduation from M.I.T., he was employed by Westinghouse Electric Company during the next four years. He completed the engineering training program and worked in the field of industrial electric heating. Then he was employed by the Detroit Electric Furnace Company as a sales engineer. From 1930 until his death, he worked in the Materials and Processes Laboratory of the General Electric Company in Schenectady. His first position of metallurgical engineer required the development of processes for making copper wire from billets, including the design of equipment for manufacturing and testing. Gradually, the metallurgical aspects of his work were displaced by responsibility for the invention and design of special test equipment. He designed most of the testing equipment in one of the largest creep and rupture testing laboratories in the U.S.A.'

"Linc didn't have a particularly rugged constitution, so there was never strength to pursue his interests and hobbies as much as he would have liked; his work and his family had to come first with him, always. He had been in the hospital for an operation and had returned home when an angina condition developed. The shock was extreme for us all, since this was completely unexpected. He was a member of the American Society for Testing Materials, the Canisteo Masonic Lodge, the General Electric Quarter Century Club, a volunteer in the Niskayuna Fire Department, the Photographic Society of America and the Schenectady Photographic Society, serving the last in various capacities, including that of president. He had started taking pictures when he was 12-years-old and loved to do his own developing and printing but never had enough time for his beloved cameras. It was in the photo society that I met him, after the death of his first wife. We were married in 1952. The last few years, he became interested in foreign cars, read 'Road and Track' for relaxation, learned how to care for his Morris Minor and my Peugeot 403. He used to say he was a 'bench mechanic' because he loved to make up a new tool from odds and ends and to repair and remake things. A perfectionist, he couldn't abide sloppy workmanship anywhere. Our home is an old, remodeled farmhouse which we were having made comfortable and 'just the way we wanted it' for our retirement. Last year, Linc bought a lot of tools, a ShopSmith, etc., with which he was planning to have a lot of fun and do a lot of work.

"Our son, Nathan, was graduated from Monson Academy and Springfield College. For nearly three years, he was physical director in the Cortland, N.Y., Y.M.C.A., and on March 1 of this year he came to the Schenectady Y.M.C.A. for the same type of work. He is married and has a daughter, Deidre. Linc did have some scientific papers published, but the only one I have had time to track down is the last one. It was written jointly with Dr. Robert M. Goldhoff of the General Engineering Laboratory and was presented at the 1962 annual meeting of the A.S.T.M. in New York City. The title: 'Stress-Relaxation of a Chromium-Molybdenum Vanadium Steel Heat Treated to Various Notch Sensitivities.' Knowing Linc, I think he probably would not care to have me say so much about him because he was the modest type who 'hid his light under a bushel.' He was kindness itself to us and to anyone who 'needed' him. He was unable to finish the odds and ends at the lab before he went to the hospital but he had planned to go back and finish, when he was well, even though he was retiring at the end of March. Sincerely, Elizabeth M. Barker (Mrs. Lincoln B. Barker)."

You now have Ray St. Laurent's class letter. Have you any suggestions for a locale for a possible interim reunion in 1964 or 1965? Shall we go back to Mexico City again for the Fiesta next March? Don't forget to continue your subscription to The Review via our annual giving to the Amity Fund.

Your secretary hopes to see you and your wife next week in Cambridge.—**Carole A. Clarke,** Secretary, c/o International Electric Corporation, Route 17 and Garden State Parkway, Paramus, N.J.; **Edwin T. Steffian,** Assistant Secretary, c/o Edwin T. Steffian and Associates, 376 Boylston Street Boston 16, Mass.

'22

Welcome to Alumni Day, June 10 with plenty of "glad to see you" greetings and a wonderful banquet and concert. Your missing secretary will have returned from Hong Kong and be visiting at Iowa State University for a special ceremony at that time. Therefore these greetings. Your assistant secretary **Oscar Horovitz** has written of his visit to Bombay with the M.I.T. Club. He also showed "The Social Beaver" in Ceylon and Singapore. He writes: "In Ceylon, Edwin R. Jeya Raj, '50, arranged for a showing of 'T.S.B.' to the staff of the Ceylon Institute of Scientific and Industrial Research. Raj heads the Chemistry Department of this lab. He has a very nice wife, one child, and lives very comfortably. He was most hospitable. Eng Hung Ong, '52, held a dinner party at his home in Singapore, where he showed 'T.S.B.' He served a most delicious Chinese dinner. He rounded up all the alumni residents in Singapore for the film's showing. Ong's architectural firm is now the leader in this field in Singapore, and he is very prosperous. He is married, has two children, a fine home, and belongs to two golf clubs. He is a very hospitable and gracious person. A friend of his manages a rubber plantation firm, and he arranged for me to film the entire process of raising and making rubber. In Sydney, Australia, we were the guests of honor at a meeting of the Australian Amateur Cine Society. The M.I.T. Alumni were invited to this meeting at which they showed 'T.S.B.' W. George Clarke, '59, arranged for me to show our film to the Educational Research Unit at the University of New South Wales in Sydney, which has an engineering school. The film was of great interest to them, and I was questioned at length about M.I.T. Alumni and students. I lunched with two professors who are M.I.T. alumni—Noel A. Hill, '48, and Dr. Hugh Muir, '53. In Melbourne, **John Carr** arranged for a showing of the film to the engineering students at the University of Melbourne."

William H. Mueser has announced that **Carlton S. Proctor** has retired and the general practice of consulting engineering will continue under the firm name of Moran, Proctor, Mueser and Rutledge at 415 Madison Avenue. . . . A clipping from "The Yarmouth (Nova Scotia) Light" of March 7 includes a large picture of **John O. Bower,** who has been elected P.C. Candidate Nova Scotia, Canada. John originally lived in Shelburne and, after receiving his degree in geology, he worked with the Texas Company in the Southwest. In 1925 he transferred to South America and in 1935 became manager of Texaco interests in Argentina, having under his administration an investment of some $300 million. In 1957 Mr. Bower was transferred to New York and was elected president and chief executive officer of Colsag Corporation, jointly owned by Texaco and Socony-Mobil Oil Company. He has been a member of the famous Explorer's Club and is past president of the Petroleum Association-Trinidad and of the Colombia Petroleum Institute. He has been president of the Board of Directors of the Anglo-American College in Bogota, which he helped found. He also was on the board of directors of the San Andres Country Club of Bogota and on the board of the Foundation of the University of the Andes. In 1955 he was awarded the Gold Medal for Distinguished Service to the Republic of Colombia. John and Mrs. Bower were with us at our 40th Reunion and later decided to retire and return to Nova Scotia. John has stated that he hoped that he could be of some service to his country, his province and his constituency after his many years of endeavor in and for other countries.

Crawford H. Greenewalt, Chairman of the Board of Directors, E. I. duPont deNemours and Company, has been named to the Academy-Research Council to appraise the nation's resources of scientific and technical personnel in relation to the demands being placed upon these resources. They will develop guide lines and suggest measures which will enable this vital supply of specialized man power to work most creatively and productively. . . . **Parke Appel** is sending out a letter regarding the Class of '22 endowed professorship pointing toward 1967. He will welcome the members at a pre-Alumni Day cocktail party on June 9. Please come and have a wonderful time. . . . New addresses received are: **Ray C. Burrus,** Washington, D.C.; **Julian B. McFarland,** Napa, Calif. . . . The sympathy of our Class is sincerely extended to the families of **Henry R. Tomlinson** of Framingham, and **Edward D. Coogan** of Guilford, Conn.—**Whitworth Ferguson,** Secretary, 333 Ellicott Street, Buffalo 3, N.Y.; **Oscar Horovitz,** Assistant Secretary, 33 Island Street, Boston 19, Mass.

'23

Forrest F. Lange, head of the Mobilization Planning Division at the Portsmouth Naval Shipyard, was recently elected secretary-treasurer of the Shipyard Chapter of the National Association of Naval Technical Supervisors. . . . **John E. Burchard,** Dean of the School of Humanities and Social Science at M.I.T., delivered two lectures on "The Dilemma of Contemporary Architecture;" the first entitled "The Unassimilated Past" was given on Monday, March 18, at 8 P.M. at M.I.T.'s Kresge Auditorium. Dean Burchard is known not only as an educational and cultural leader, but also as an authority on housing and architecture. His recent book "The Architecture of America, A Social and Cultural History," written with Albert Bush-Brown, President of the Rhode Island School of Design, has been widely read and acclaimed. In his first lecture, Dean Burchard discussed the difficult question of how contemporary architecture can draw upon architectural traditions. With some examples of architecture from India, Iran, Japan, Greece, Lebanon and elsewhere, he commented on what he believes is missing in present architecture. The second lecture "The Evolution of Confusion" was given on Monday, April 1. . . . **William Webster,** President and Director of the New England Power Service Company and the New England Electric System, has been named by President Kennedy to membership on the General Advisory Committee of the Atomic Energy Commission. . . . Two of our classmates, and their wives, attended the M.I.T. Fiesta in Mexico City in March, namely, **Jack Zimmerman** and **Harold Pearson.** A résumé by Jack is as follows: "The Fiesta opened with a lunch at the University Club which gave us all a chance to get acquainted. There were about 40 or 50 present, at least half of whom were visitors. We were greeted by President Alvino Manzanilla, '31, of the Alumni Club, and received further welcome from Clarence M. (Nish) Cornish, '24, who is very active in Alumni matters in Mexico City. The following day we were invited to meet at the home of President Manzanilla before attending the Arts and Crafts Fair. It was, indeed, an experience to visit this palatial residence which was a museum in its own right. President Manzanilla is a great hunter, and he had the most complete collection of taxidermy specimens I have ever seen. In addition, the various rooms we visited were almost completely lined with cases containing curios of all kinds such as carved ivory, jade, and rare specimens of every conceivable description. Following this, we were given a special tour of the Art Trade Exhibition and Fair in a big convention hall in the city where we were shown exhibits of the many items manufactured in Mexico which varied from automobiles and sewing machines to soap and candy bars. Most interesting at this Fair were the arts and handicrafts exhibits from all sections of the country. In most of these booths the products were actually being made by hand, and there were extensive offerings for sale on the spot of the many types of pottery, textiles, silverware, etc. The visit to this Fair also included a presentation of the wonderful folklore ballet currently in action at the civic auditorium. This was, by far, the finest series of native folk dances that I have ever seen. We later attended the entire show and I certainly can recommend it. The dances and music portrayed the history of Mexico from the days of the Aztecs through the Revolution to the present period. The Fiesta concluded with a most interesting Noche Mexicana at Nish's estate. He has a very large yard, beautifully landscaped, in which were set up seven or eight food booths, each with a native attendant, and each cooking some Mexican food specialty. Needless to say, there was also a large bar and plenty of circulating waiters. The whole evening was spent out under the trees, and we were entertained by a marimba trio, as well as native dancers. All of the Mexicans present were in their native costumes and it was a wonderful experience and a beautiful Fiesta."

We regret to report the death of **Lawrence E. Duane** in Beverly on February 24. Lawrence was a prominent Beverly Democrat, a well-known attorney and active in civic affairs for many years. Mr. Duane maintained a Cabot Street law office for 35 years. He was an outstanding worker in the Democratic party for 40 years and was a familiar figure at several state conventions. Born in East Bridgewater, he had lived in Beverly most of his life, and was a graduate of Beverly High school, attended Massachusetts Institute of Technology and was a graduate of Suffolk University Law School before passing the bar. He was a member of the Monsignor John A. Degan Council, Knights of Columbus, the Beverly Democratic City Committee and the Essex Bar Association. . . . We wish to report the following address changes: **George W. Bricker, Jr.,** 56 Turtle Back Road, Wilton, Conn.; **Lewis N. Brown,** 17 Palmer Street, Arlington 74, Mass.; **Ernest A. Davis,** 111 Little Hill Drive, Stamford, Conn.; **Charles Goldstein,** 79 Milk Street, Boston 9, Mass.; **Harry Green,** H. Green and Company, Inc., 350 Park Avenue, New York 22, N.Y.; Professor **Kent T. Healy,** R.D. #3, Chestnut Hill Road, Killingworth, Conn.; **Lowell L. Holmes,** P.O. Box 1603, Sarasota, Fla.; **E. Fletcher Ingals,** 54 Bar Beach Road, Port Washington, N.Y.; **John B. Nason, Jr.,** 935 Remington Road, Wynnewood, Pa.; **Edwin H. Schmitz,** 209 South Columbia Avenue, Columbus 9, Ohio; **Philip S. Wilder,** 12 Sparwell Lane, Brunswick, Maine.—**Herbert L. Hayden,** Secretary, E. I. du Pont de Nemours and Company, Leominster, Mass.; **Albert S. Redway,** Assistant Secretary, 17 Old Orchard Road, North Haven, Conn.

'24

Let's start this column on a note of honors and business successes. First of all, **John F. Hennessy, Sr.** was presented with the Founders' Medal by the New York Association of Consulting Engineers at a dinner in late March. He was the first recipient. In an "interesting and all-encompassing talk (Mr. Hennessy) spoke on history, theory, Board of Education problems, and reminisced a bit about his successful career in the construction industry." That's covering a lot of ground, but we're certain Jack did it well. . . . Also in March, **Elbert C. Brown,** Assistant to the President of the Hartford Electric Light Company, received a fellow diploma from the Connecticut section of the A.I.E.E. Bump has been in the utility business since graduation, joining HELCO in 1951. . . . **B. Alden Cushman** has added another vice-presidency to his lengthening list of titles, this one with the International Holdings Corporation. . . . You remember we told you a while back of Anne, daughter of **Kaare Aass,** who came to New York from Oslo with training as a physiotherapist, but no job? She landed on her feet, is now working in a Brooklyn hospital. . . . And here's one that will come as a real surprise to many of you. After 39 years with Hoffman-La-Roche, our acting president, **Paul J. Cardinal** has retired: "My early retirement was not brought on by bad health but to some extent by good health! I'm still playing tennis and the courts will soon be in shape." Must be all those vitamins through the years. Of course this will give Paul lots more time for class affairs, but it's not clear how he will be able to operate without a raft of secretaries.

Well, the peripatetic **Lehrers** are back home again. Last month we left them in the far South after boating across the Andes. From there they went to Buenos Aires which still seemed to have a Peronista cloud hanging over it. Then on to Iguassu Falls on the Argentina-Brazil border, "wider than Victoria and higher than Niagara." At breakfast one morning overlooking the falls, a family of tapirs showed up looking for handouts, fished in Ray's pockets and tried to climb in his lap. If they were like the tapirs your secretary has seen in zoos, this must have been a somewhat trying experience. Of course they went to Brasilia, which is evidently just as fantastic as the pictures would lead you to believe. Then Rio, Caracas, and home. "Next volume, Africa."

Last month we had the unhappy task of reporting to you the death of our president, **Blay Atherton.** This month we have to report on the passing of six more of our classmates. **John J. Parsons** died in New York in March. Until 1960 Jack had been with IT&T in many parts of the world, in recent years in New York. In that year he became a member of the New York State Service Commission. . . . Last January **Guild R. Holt** died in New Jersey. You will remember Gubby as an outstanding cross-country runner. He was one of our naval architects who never followed that line. At the time of his death he was senior engineer with Bendix Corporation, in Teterboro. . . . Also in January, **Fred C. Wagner** died. After graduation he went on to get his Ph.D. at Johns Hopkins and was with DuPont for years. He retired to California in 1960. . . . Two deaths which oc-

curred last year have just been reported. **Harry G. Miner,** a teacher in Louisville, and Dr. **Wilhelm Kupferburger,** a geologist in Johannesburg. . . . The final name on this regrettable listing is that of Colonel **Alan L. Campbell,** a regular Army officer who was in Course II for a short while.

Yesterday a young alumnus asked your secretary if he knew "one of our older Alumni named—?" Not knowing him, we looked him up in the Alumni Register. There he was indeed, Class of 1925! It's writing paragraphs such as the above that makes one think the description may be warranted, but then again, looking out in the Great Court—seeing bursting buds and hopping robins and raking groundskeepers—there are many springs ahead for most of us. And we can all be grateful for those we have been privileged to see. —**Henry B. Kane,** Secretary, M.I.T., Room 1-272, Cambridge 39, Mass.

'25

Fortunately the Standard Oil Company of New Jersey provided a release involving a member of the Class of 1925, or for the first time in a number of years we would not be represented in these columns this month. This release stated that **Marion W. Boyer,** a director of the Company since 1955 and a vice-president since 1960, has been elected to the Executive Committee and designated as an executive vice-president. The release provided an excellent statement regarding Marion's history and accomplishments, and it is felt the members of the class would be interested in seeing them in this column. A quote from the release reads as follows: "Mr. Boyer, who was born in Muncie, Ind., in August, 1901, served from 1950 through 1953 as general manager of the United States Atomic Energy Commission. Except for that period, he had been with the Jersey Standard organization since 1927. Previously, he had been with the Research Laboratory of Applied Chemistry at the Massachusetts Institute of Technology.

"He attended Georgia Institute of Technology from 1919 to 1921, and was graduated from Massachusetts Institute of Technology in 1925 with a degree in chemical engineering. He took his master's degree from M.I.T. the following year. Starting as a chemical engineer in the Esso Laboratories at Baton Rouge, La., in 1930 he was named head of the laboratories. In 1931, he was made head of the technical service division in the Baton Rouge refinery, one of the world's largest, where many major developments in the oil industry have been pioneered. Two years later he was appointed general superintendent of the plant. In 1935, he was elected to the board of Standard Oil Company of Louisiana (now Humble Oil & Refining Company). The following year he was elected vice-president, and in 1945 became head of all Esso's Baton Rouge operations. Transferred to New York in 1949, he assumed responsibility for all manufacturing operations of the company. In 1960, when he became a vice-president, he was named chairman of the Board Advisory Committee on Investments, which recommends investment policies and evaluates proposed investments by the company and its affiliates. Mr. Boyer is a member of the board of trustees of the Sloan-Kettering Institute for Cancer Research. He is also a member of the board of directors of the Commerce and Industry Association of New York."

The only other item of news comes to me from the several address changes received during the past month, most of which are moves within communities. However, there is one which concerns **Ralph O. Ballentine** who in the last "Register of Former Students" was shown as an engineer with the Eastern Massachusetts Street Railway Company in Boston. A recent change of address places him at 1056 Van Voorhis Road, Morgantown, W.Va.—**F. L. Foster,** Secretary, Room 5-105, M.I.T., Cambridge 39, Mass.

'26

This is 7 A.M. Sunday morning, April 7 at Pigeon Cove, a beautiful morning. The card from the Review Editor says that the notes are due April 15 but we are leaving April 12 for a bit of relaxation in Nassau so it's now, or the June notes do not get written. It's a little bit more than that because a week ago today we decided to move the 13 x 15 el on the guest house and by Thursday it was moved 40 feet northeast—fireplace, chimney and all. How they did it I'll never know, because the fireplace sat right on the ledge but up in Marblehead there are some building movers who have been doing this kind of moving for generations and they came down in a horde with a magic wand and off she went. Now while I'm away there must be work done, so at 8 A.M. the stone mason arrives, at 9 the carpenter, at 9:30 my handy man Gunner and when church is out at 11 the crane operator to talk about moving some heavy stone—all of these to talk to except Gunner.

So again I am covered with horse shoes or else this wail of mine to please send a letter to the class secretary is beginning to get under the skin. At any rate, after all of these years who should come out from under the rocks but **Bill Millar** whose letter reads: "Dear George: It occurs to me that writing of personal doings to a class secretary can be divided into three eras, if my experience is typical: (1) Just graduated, with the academic bloom in full flower, write voluminously of 'Sealing wax and kings'; (2) Middle period—too busy, too many incursions of problems and kids, hence no letters; (3) Over the hump, coasting part of the time, reflective and philosophical (Republicans can't be in all the time), write a letter to start the new cycle. This is it. Moved West in 1960 and bought a ranch in the mountains of Southern Arizona with consulting work now generally limited by choice to the Western states. Three kids, 16, 11 and 9 and no further ambitions thataway. Long since from disuse have forgotten a lot of good stuff that M.I.T. taught me but still bask in the undeserved glory of that great school. When not rambling for pay on geologic problems—40,000 car-miles last year—I research in my rock lab. Right now it's an Arizona souvenir which is headed for filling stations on a road map with, I think, unique location markers. (Bill's letterhead has two interesting pieces of rock attached; good enough for a jewel, GWS.) There's a shortage of '26ers here in Patagonia but should any of same pass by en route to Guaymas and sea bass, please stop by for snorts and a sardine. Also, George, be good enough to give my best regards to fellow VOODOOer, Chick Kane, and tell him if he will draw the pictures, I'll try again on the words. For what I don't know, but you have to start, or finish, somewhere! Sincerely, Bill."

Carole ("Cac") Clarke, Secretary of the Class of '21, recently sent us an envelope full of clippings about **Barney Gruzen.** We knew that Barney had some important architectural achievements under his belt but we did not realize how important. The clippings give some idea. In addition we recently saw a list of the 10 largest architectural firms in the country and sure enough well up on the list was Kelly and Gruzen. The first clipping is quite long and describes a new state prison building to be built at Leesburg, N. J., which won the "Award of Merit" sponsored by the magazine "Progressive Architecture," the award being accepted by Governor Hughes of N. J. and Kelly and Gruzen, the architects. To quote from the newspaper article: "Work will begin here this spring on a new state prison whose design amply supports that old saying: "Iron bars do not a prison make." The fact is, iron bars will not mar the beauty of the new $10,000,000-medium-security prison, or at least none that will be visible. In designing the prison buildings, the architects said they have created a "secure prison plan" but one that is aimed at eliminating an oppressive sense of confinement. According to the plan, inmates (not prisoners) will live in individual rooms (not cells) in one of six housing units (not cell blocks) arranged in a pattern of interlocking, flower-filled courtyards. The rooms will be decorated in cheery colors. Inside will be a built-in chair and writing desk, a hidden toilet, louvered windows whose design hides escape proof bars, and a barless door with a glass panel that looks out upon a glass-enclosed courtyard." Certainly designing a prison must have been a challenge because they have historically been drab places, not at all conducive to rehabilitation. We thought Barney had reached his peak with his United Nations Building but in years to come, the prison building may well be a greater contribution to society. Coming right after the award, another achievement in Barney's career must give him great satisfaction. Again we quote: "B. Sumner Gruzen of Maplewood, architect of the United States Mission to the United Nations and the Albert Einstein College of Medicine, has been elected national president of the American Technion Society. Gruzen has

developed large scale housing projects, universities, military installations, industrial plants, religious buildings, and community centers. He has been a leader of the Essex County United Jewish Appeal and the Federation of Jewish Philanthropies in New York. The American Technion Society sponsors the Technion-Israel Institute of Technology in Haifa, Israel." Congratulations Barney!

Three deaths mar the record this month: **George P. Rupert, Domenico Sicardi de Amicis** and **Richard H. Staples,** who died more than three years ago but we just learned of it. . . . Having already had one interruption (the stone mason came at 7:30 instead of 8 A.M. and also having used up what seems like a fair allotment of Class News space, we will sign off and start hunting around for some summer clothes to pack into the suitcase, and we will have to hunt because it was 32 degrees F here at Pigeon Cove this morning. Hope to see many of you at Alumni Day in June. Till then and the July issue, Cheerio.—**George W. Smith,** Secretary, E. I. du Pont de Nemours and Company, 140 Federal Street, Boston, Mass.

'27

"For a 14-year-old to pilot an outboard runabout the 1,250-odd miles from Washington to Miami with his dad as navigator is a great adventure. But for the two of them to do it with no more experience than an excursion in a rented outboard, plus a couple of trial spins down the Potomac, is almost unimaginable. **Frederick W. Willcutt** of 6934 33rd St. N.W., Washington, D.C., and his son Bob recently made the journey down the Intercoastal Waterway despite storms, engine troubles, groundings, riptides and waves that rolled over the bow, windshield 'and into their laps.' Both are back safely. . . . Two years ago, Willcutt rented a skiff powered by a 7½-horsepower motor and father and son took a cruise from Ocean City down Chincoteague Bay. On the way, the boy became so entranced with the Intracoastal Waterway markers pointing toward Miami that he said: "Wouldn't it be great, Dad, to go all the way?" It was the birth of the idea that led to Willcutt's purchase of a fibreglass runabout, 14 feet 9 inches long, marked down to $750. . . . Then thru the winter, he crammed on boating, following the Coast Guard Auxiliary on television, obtaining charts, guides and asking the advice of friends." All of the above is quoted from the Washington Star. I wish there were space to quote much more that follows. Fred bought a 45-horsepower motor and equipped the boat with instruments and safety gear. He and Bob encountered nothing but foul weather, shoals and engine trouble, but in 15 days they showed up, "mission accomplished," in Miami. To quote the Star again: "As they pulled up to the dock they saw a large yacht with Maryland numbers. It's skipper said: 'We've just come all the way from Annapolis.' 'That so?' Willcutt replied." All this happened last summer, but as Fred says in his letter, some of the class members knew of the idea at the time of the 35th Reunion, and the boating season is coming around again. This was the smallest boat ever to make this trip.

Ed Damon has sent in a postcard from Honolulu. Where are the rest of you retirees hanging out? . . . **Frank C. Staples** is president of the SuCrest Corporation. Last month, as chairman of the Dyer Award Committee, he judged and presented the Sugar Man of the Year Award. . . . Dr. **Henry Houghton,** head of M.I.T.'s Department of Meteorology, participated in a Boston television series on the weather. His research on the solar radiation balance, atmospheric condensation processes and the solar constant is known the world over. . . . I had the pleasure of visiting with **Luke Bannon** last month in Florida. Luke has an orange grove at Sanford. This being pretty far north, he was hurt some this year by the Big Freeze. It was a pure lottery; if he had scheduled the picking three days earlier, the story would have been different. He still has an interest in his architectural firm in Hohokus, N. J., but headquarters are definitely in the South, which seems to appeal to Luke and Mrs. Bannon. . . . Here are the new addresses received: **Armand E. Bourbeau,** IV, Roads Department, Parliament Building, Quebec, P. Q., Canada; **Walter D. Burger,** IV, 4331 Marina City, Chicago 10, Ill.; **Frederick J. Hooven,** XI-B, 910 Sunningdale Drive, Bloomfield Hills, Mich.; **Henry W. Newell,** I, Holly Drive, Ironville, R.D. #1, Columbia, Pa.; Professor **Percy M. Roope,** VIII, PO Box 664, Atascadero, Calif.—**Joseph S. Harris,** Secretary, Masons Island, Mystic, Conn.

'28

If you have the good habit of reading The Review promptly after receiving it, you will have these notes before you while the reunion at Harwichport, Mass., is still a few days away. Although we have close to a full house signed up even as this is being written, a place will be found for everyone who comes, and there is still time for you and your wife to pack a weekend case and set out for Cape Cod. . . . **Jim Donovan** has had many notes with the registration material received at his office. **Monte Burgess** wrote from Bell Labs in Whippany, N.J., where he has been working for the past four years. Prior to this he was at Bell Labs in Garden City, N.Y. He still maintains a home at both locations. . . . The **Vincent Caputos** sent in reservations not only for themselves but also for their close friends, Sally and Danny Rossano (past president of Wentworth Institute Alumni Association). . . . Other recent registrants are the **Samuel Weibels,** the **George Bernats,** the **Carney Goldbergs,** and **Max Bearon.** . . . **Maxwell Parshall** sent his regrets from Colorado State University where he is professor of civil engineering. Final exams and commencement week will prevent his attendance at the reunion. Max sent his best wishes for a successful reunion and supported this with his check for five dollars. The Parshalls are expecting a grandchild this summer.

George Chatfield, our good class secretary, has returned to Massachusetts. George is the new owner of Radio Station WFGM in Fitchburg, an acquisition made on November 1, 1962. George finds the change from the big advertising agency business in New York to broadcasting station management a challenging one to say the least! George and Marie now have their home at 242 Pearl Hill Road, Fitchburg, Mass. To you both, our very best wishes for all success and a happy new life! . . . With deep regret we must report the death of **Ermanno A. Basilio** on March 30, 1963. Coming at this time, Ermanno's death is particularly sad. His wife, Iris, wrote to say that he had been looking forward to the reunion. —**Walter J. Smith,** Assistant Secretary, 15 Acorn Park, Cambridge, Mass.

'30

Students of the cyclic aspects of life may be interested to learn that the returns from the information forms I send out each month exhibit a rather well-defined recurrent pattern. This year, as in the past two years, these returns have fluctuated between a hibernal nadir of perhaps 10 per cent and a vernal zenith of about 70 per cent. This month we are riding the crest of the curve. . . . From Long Beach, Calif., **Warren Martell** reports that he has retired, except for such jobs as comptroller of the Mojave Marsh Reclamation Authority and concertmaster of the Blue Pacific Duo Ensemble. He reports having seen **Bob Rypinski,** who is now working for the S.T.L. in California, and **Hal Spaans** when he passed through Los Angeles last summer. . . . **Allan McLennan** is working for the New England Electric System on Substation and Generating Station Design. The McLennans live in Wakefield, Mass. They have three children: Anne (Mt. Holyoke '60), Margaret (Colby Junior College '62) and Robert, who attends Webster Academy. . . . **Hijo Marean** both lives and works in Marblehead where he has a real estate and insurance business and deals primarily in North Shore residential properties. The Mareans have three children—David, Carol and Linda, of whom the older two are married and have two children each. Hijo indicates an interest in boating, but fails to specify sail, power or row. . . . **Mary Chute** (Mrs. Samuel **McMurtrie**) is living in Denver. Her daughter Mary graduated from Smith in 1955, is married, and has a daughter—also named Mary. Samuel, Jr. graduated from Dartmouth in 1960 and is now a lieutenant j.g. in the U.S.N.R. Son John is a student at the University of Vermont.

Ed Mears is vice-president, of Dewey & Almy Chemical Division, W. R. Grace and Company and president of the Lexington Golf Club. The Mears have three children: Walter (Middlebury, '56), Carolyn (Middlebury, '58, Wesleyan M.A., '60) and William (Wesleyan, '64).

. . . **Joe Miller** has made a circular series of job changes in recent years. He retired from Ebasco Services, Inc. about five years ago, then spent a year and a half supervising the installation of the control system of the Boston South Postal Annex "Mail Flo." Thereafter he worked a year for the Austin Company and is now back with Ebasco. His older daughter, Ruth, graduated from Wellesley and is doing research for Dr. Killian. Son Joseph graduated from the University of Utah and is with G.E. in Los Angeles. Daughter Alice studied landscape architecture at Lothrop School and is now married and living in Holliday, Utah. Joe is active in the New York Chapter of the P. E. Society, an avid camera fan, and is supervising construction of his church pavilion at the New York World's Fair. If my records are complete, he is also the current holder of the class grandchildren record with a total of 13. . . . Amplifying the brief comment about **Willard Morain** in last month's notes, in addition to his job supervising cryogenic design work at Cooper-Bessemer, he is special projects engineer working with free pistons, special engines and thermodynamic analyses. In collaboration with Frank Lewis and Joseph Keenan, '22, he did the first free piston work in the U. S. and has recently completed work on a large expansion engine for 410 degrees F. service. The Morains have three children: Richard (Otterbein, '59), an Air Force first lieutenant, Susan (Otterbein, '63), teaching French and Spanish in Fremont, Ohio, and William, a junior at Mt. Vernon High. Among Willard's long list of hobbies are: collecting "martial arms of all types from colonial period to date, U. S. coins, oil lamps, watches, hand-worked silver and Indian artifacts." He is active in the Boy Scouts, Chamber of Commerce and the Masons, a member of the SAE Engine Nomenclature Committee and a radio "ham," call letters WBWWU.

Gerry Morse is vice-president of Minneapolis-Honeywell Regulator Company in charge of both domestic and foreign employee relations (about 50,000 employees). His extra-curricular activities are so numerous that a complete list herein would unduly inflate The Review's printing bill. Typical items are: director of Minnesota Hospital Service Association, St. Barnabas Hospital and Associated Industries of Minneapolis; member of Governor's Advisory Council on Unemployment Compensation, American Management Association Planning Council, Personnel Advisory Council of N.I.C.B., Labor Relations Council of Wharton School at University of Pennsylvania, and Industrial Relations Committee of Aerospace Industries Association. The Morses have a daughter Gillian who is a high school senior. . . . **Joe Harrington's** daughter, Anne, a Wellesley senior, was recently awarded a Woodrow Wilson Fellowship for graduate study next year. . . . Changes of address: **Roy Ide,** 425 North Center Street, Statesville, N.C.; **Edward J. Rhodes,** 1010 East Coronet Street, Glendore, Calif.; Dr. **Howard A. Robinson,** 73 Roxbury Road, Garden City, N.Y.; **Ralph H. Swingle,** 5700 Bunkerhill Street, Pittsburgh 6, Pa.—**Gordon K. Lister,** Secretary, 530 Fifth Avenue, New York 36, N.Y.; **Ralph W. Peters,** Assistant Secretary, 68 Village Lane, Rochester 10, N.Y.; **Louise Hall,** Assistant Secretary, Box 6636, College Station, Durham, N.C.

'31

A welcome letter from my old friend, **Norman D. Fitzgerald,** who is now living in Abilene, Texas, says: "Have finally been jolted into writing you a note, because come June our second son, Carl Hanson, expects to get a degree in mathematics from M.I.T. After all these years, I thought the least I could do was to endorse my belief in the school by making this second generation event a matter of record." Norm goes on to say: "Petroleum exploration, development, and production aren't booming, but it is still a lot of fun. Our efforts in West Central Texas are devoted to finding and producing oil for ourselves and associates. Some 18 years have passed since we made this change in our way of life. From a desk in Wall Street to the ranches of Texas is a pretty drastic move, but we find more satisfaction in doing than advising." . . . Another of our classmates, **Myrle Perkins,** has just returned to the colder climate of New York from sunny California. Perk wrote that "after a five-year stint in the Bechtel Corporation head office in San Francisco, I have been transferred to New York to handle contract sales work in the New York area. The work will be very similar to my assignment in San Francisco except that the climate will not be quite as nice . . . Since the last time I saw you, Frannie and I have become grandparents for a second time. Our first grandchild was a girl born in Japan and the second a boy born in San Francisco. My daugher and her husband are in the Navy for the time being and are assigned to Treasure Island. My other child, Johnny, is a sophomore at the College of Idaho." . . . **Gordon Speedie** spent the night with us 'en route' to New York recently and as always we had an enjoyable evening chatting about our Tech days, classmates, and settling the affairs of the world. . . . Last but certainly not least, an article in the March issue of 'The Reflector' tells that Dean **Gordon S. Brown** was made an eminent member of the Eta Kappa Nu Association, electrical engineering honor society on March 25 at the I. E. E. E. Meeting in New York. . . . Address changes received during the past month include **Charles A. Bicking,** 773 The Circle, Lewiston, N.Y.; **Albert F. Coleman,** Cotswold Lane, Cherry Hill, N.J.; **Louise Jordan,** 1218 Westlawn Drive, Norman, Okla.; **William C. Mentzer, Jr.,** 2020 Newell Road, Palo Alto, Calif.; Dr. **William Metcalf,** 950 Park Avenue, New York 28; and **John W. Smith, Jr.,** 19 Burgess Road, Falmouth Foreside, Maine.—**Edwin S. Worden,** Secretary, 35 Minute Man Hill, Westport, Conn.; **Gordon Speedie,** Assistant Secretary, 90 Falmouth Road, Arlington 74, Mass.

'32

This column will probably reach you a few days before Alumni Day, Monday, June 10, 1963. A few words to encourage you to make last minute decisions to attend may still be in order. Last year a number of classmates attended the Monday Alumni Day affairs and we expect to see them and others back this year. Since we never did list them in these columns we will do it now: James D. Abbott, Donald W. Brookfield and wife, Wendell E. Bearce and wife, Albert W. Dunning and wife, Francis T. Gowen and wife, Theodore J. Jones and wife, Arthur Lowery, Frederick E. Mader, Robert E. Minot and wife, George W. Muller, Jr. and wife, G. Edward Nealand, William B. Pearce and wife, Frederick J. Powers, William H. Radford, Russell S. Robinson and wife, Elwood W. Schafer, Tom Sears, Jr., John P. Serrallach, James B. Smith and wife, Albert A. Stewart and wife, Charles H. Taylor, and Harold F. Tonsing. . . . And for those of you who have old friends in the Class of '33, they will be in this area for their 30th Reunion.

Lee Herring, II, is with Melpar in Washington. His assignments include various field tours, one of which will take him to Arizona next fall for a nine-month period. Captain **John W. King,** USN Ret., XVI, and also a graduate of Annapolis, offers a prime example of a military man who can retire from the service and build a new successful enterprise. He retired in 1953 and is now director and chairman of the board of Power Generators, Inc. His firm is located in Trenton, N.J., and has designed catapults for aircraft carriers, outboard diesel engines and been active in fabricating large distillation units for water desalination. . . . **Donald W. Fetters,** XVII, is president of Gerhardt Meyne Construction Company in Chicago. His firm does heavy construction and other general contracting work. . . . **Stuart R. Fleming,** XVII, is vice-president and a director of Ford, Bacon, and Davis, Engineers, New York City. He resides in West Orange, N.J., and recently made a trip to British Columbia, Canada, to make an evaluation of natural resources and property for his firm. We hope to see many of you on June 10 and, if you arrive early, use my office and my secretary Carole to help locate other classmates in town, or call me anytime day or night at home, Wenham, Mass., HOward 8-2724. —**Elwood W. Schafer,** Secretary, Room 10-318, Ext. 621, M.I.T., UNiversity 4-6900, Cambridge 39, Mass.

'33

You have just six days to pack those bags and hurry to Woods Hole for the reunion. It shapes up as a gala and memorable event with a good turnout of men, many wives, and a sprinkling of almost grown-up young fry. So give yourselves that five-year break that will be truly refreshing. . . . Honors of the

month to two young men in a hurry—**Wendell Allen** and **Herb Grier.** Wendell is now general manager of Truc Train Service of the Pennsylvania Railroad, a new position centralizing executive direction for the operation, sales and promotion of this fast growing service. Wen has been with the Pennsylvania since 1934. He was with the B & M as a co-operative student and was father of the model railroad activities at Tech, according to Professor J. B. Babcock. . . . Herb is in the new post of senior vice-president of Edgerton, Germeshausen and Grier. We conclude that Herb will still make Las Vegas his headquarters but continue to spend too much of his time in an airplane.

A late report in from **Warren Henderson** on that Peruvian fishing venture with Leona. They caught several striped Marlin, but the black variety had left for warmer climes because the water temperature was only 72 degrees. Who would suppose that black marlin are virtually tropical? Warren and Leona will be right there on the front porch at Woods Hole Friday, the 7th, to properly greet all old friends. It's worth the trip just to fall heir to a few of Warren's bon mots, complete with New Hampshire twang and Black Angus spice. . . . **Ed Goodridge** comes out of his short-lived retirement with the announcement that he is an engineering and management consultant. Quite a guy! And a distinguished record of achievement that gives him all the qualities needed to provide wise counsel.

Seen recently on campus, and all looking hale, hearty, and handsome: **Newt Buerger,** a professor of metallurgy on the West Coast, just finishing a round-the-world sabbatical. Newt's son is a jet pilot for the navy, and his married daughter is living in Hawaii. . . . **Ivan Getting** was on campus for a meeting of the Visiting Committee on Aeronautics and Astronautics. The whole class is happy indeed that Ivan will be a member of the Institute's Corporation next year. . . . **Musty Mostafa** stopped by to see his son, Hatem, who graduates this June in Course XV. Musty had come down from an important international meeting in Canada which he attended on the special invitation of the Canadian government. . . . **C. T. Newton** seems well re-oriented to life in these United States after his two-year stint in Cambodia. Newt promises to be at the reunion and will give us a first-hand report of his travels. . . . As these notes go to press, our **Pete duPont** is facing up to hand carrying no less than two daughters down the aisle to matrimony, all within one month. Lots of excelsior around the house, we bet! Having been through this before, Pete is surely equal to the task. Hurry, hurry, hurry to Woods Hole and then on to Cambridge for June 10.—**R. M. Kimball,** Secretary, Room 7-206, M.I.T., Cambridge 39, Mass.

'34

When I (H.E.T.) was in New England about the middle of March, I had the pleasure of visiting a classmate for the first time in 'Y' years since graduation, by stopping in at the Sprague Electric Company. **Frank Jenkins,** who is in charge of Sprague purchasing, and I had an opportunity to talk about a number of you and to get caught up, rather quickly, on the news. . . . In the mail this month, I received the following press releases on two more classmates. On February 11, 1963, **Ernest A. Massa,** vice-president of Massa Division of Cohu Electronics, Inc., attended a conference of NASA-Industry representatives with the purpose of outlining to industrial management the long-range plans for research and engineering which NASA is instituting. The group were entertained at a luncheon given for the Massachusetts representatives by Senator Kennedy. In connection with this luncheon, plans for the establishment of a NASA Research Center in the Boston area were discussed. . . . Dr. **Nolan Poffenberger** was recently named research scientist of the Dow Chemical Company's Midland Division in Michigan. Among his many accomplishments in the fields of chemistry and chemical engineering is the development of the Dow Udex process, which is a process for extracting aromatic hydrocarbons from petroleum or mixed hydrocarbons. In addition to his many accomplishments in the chemical field, he found time from 1952 to 1954 to serve the City of Midland in the office of the mayor. Congratulations.

If you read in 'Time' magazine about the baby who lives in the germ-free box, you might like to know that one of our own classmates (16 years ago) built a similar special box for his daughter, Barbara. The father who is so ahead-of-the-times is **Allan K. Cook,** now a manufacturers' agent in Louisville Ky. Recently the Louisville Courier-Journal featured an article about this box built for a total cost of $75. Allen had read an article on the subject of the germ-free box written by a psychology professor at Indiana University, and since this was shortly before the birth of his daughter, he wrote the professor, who sent him plans for the box. The temperature was always kept at 84 degrees and was controlled by five thermostats and an air filter and fan, which kept the air pure. Barbara Cook is a wonderful advertisement for infant life in a germ-free box, as she is very active and healthy teenager who carries a 93 average in her subjects at high school.—**Harold E. Thayer,** Secretary, 415 West Jackson Road, Webster Groves 19, Mo.; **G. K. Crosby,** Secretary, International Nickel Company, 67 Wall Street, New York 5, N.Y.; **J. P. Eder,** Secretary, 1 Lockwood Road, Riverside, Conn.; **Malcolm S. Stevens,** 9 Glenfield Road, Barrington, R.I.

'35

Alumni Day is June 10. If you act quickly, there is still time to join some of your classmates and their wives for the evening cocktail hour and banquet. A concert by the Boston Pops Orchestra follows in Kresge Auditorium. . . . With further reference to our 30th Reunion, here's **Jack Colby's** letter to **Leo Beckwith:** "I will have to admit that the returns to your questionnaire look rather disheartening. Much as it hurts me, I must agree that we should drop the whole program. In addition to the poor returns, I will have to admit that **Stocky** had a point in his letter in that you limit such a reunion to a few select members. To a transplanted New Englander, Cape Cod holds many fine memories. We had a fine time at Chatham Bars Inn. I put my vote in for the Cape. It is a sure sign that I am getting older when I give up this easily." By next month's notes we should have the site pretty well established even though we are two years away from our 30th. . . . **Ned Collins** is surely doing an excellent job in the mid-western area extracting information and news from reluctant classmates. Here are some more letters he has passed along for the notes. The first is from **Buckley Crist** who is currently vice-president of United Sound and Signal Company. He writes: "Your persistence is finally paying off. I'm one of the world's worst correspondents, but you certainly deserve an answer after your campaign. Next week I am moving to Downingtown, Pa., 3 Taylor Road. A year ago, I moved from Indiana to Devon, Pa., where I have been doing some management consulting. Recently, with an associate, I wound up buying one of the companies for which I was consulting. This is United Sound and Signal Company, Columbia, Pa., a manufacturer of vending equipment. We manufacture soft drink venders, a newspaper vender, and we also do some contract manufacturing. Our plant is on the banks of the Susquehanna which is a mile wide at this point, and I anticipate some sailing out here after the ice jam breaks up. Both boys are away at college—one is a sophomore, the other is a graduate assistant going for his Ph.D. in chemistry. Hope this will give you a little ammunition, Ned. You will probably want to transfer me out of your territory now." . . . **John Shurcliff** writes from Tullahoma, Tenn.: "Thank you for your patience. Perhaps if I had attended Tech four years instead of one I would reply to the first letter rather than the fourth. We are doing fine. We are making a crayon of my invention which writes with 25 colors in one crayon. The response to it is, I think, going to more than offset the headaches which its incubation has caused my wife and myself. Toward the end of March, my daughter Frances and I plan to fly to London to attend the first Baha'i World Congress."

Henry W. Hope received his master's degree with us in 1935 and now lives at 206 First Avenue, North, Humboldt, Iowa. He wrote to Ned as follows: "From 1933 to 1939, I was in Quito, Ecuador, South America, with Electric Light and Power Company; I had a most interesting experience learning the Spanish language, customs, history, etc. I came back from South America in June of 1939 and for one year was line and substation inspector with the Rural Electrification Administration. In August of 1940, I went with Stanley Engineering Company, a

consulting engineering firm in Muscatine, Iowa, and was there until 1948. In January of 1948 I came to Humboldt, Iowa, as manager of Corn Belt Power Cooperative and have been there ever since. I married Anna Morrow of Hillsboro, Ohio, in 1939. We have three daughters: Rebecca, now Mrs. Jay Short of Sioux City, Iowa; Susan, a junior at Cornell College, Mount Vernon, Iowa; Ann Stewart, a sophomore in Humboldt High School. Corn Belt Power Cooperative is an REA-financed power co-operative, serving 31,000 farmers in North Central Iowa, through 13 member distribution co-operatives. We have two steam plants and eight diesel plants, totaling 115 MW, 950 miles of 69 Kv and 115 Kv line. We are a member of the Iowa Power Pool, are interconnected with the U. S. Bureau of Reclamation, and 13 municipals having their own electric systems."

Tom F. Morrow, Vice-president of Chrysler Corporation, wrote a brief note as follows: "Many thanks for your numerous letters and your insistent kindnesses in asking me to correspond. I really have nothing to report that would be of great interest. I find myself plowing deeper and deeper into more work and, therefore, find very little time for some of the niceties. Appreciate your thinking of me. I have found the notes of the class most interesting." For a more detailed report of what Tom is doing, read the February 'Fortune' which had pictures of approximately a dozen of the Chrysler management team, including Tom, that is leading the company to new heights in sales and profits. . . . **William Wesley Peters** is chief architect of Taliesin Associated Architects of the Frank Lloyd Wright Foundation, Scottsdale, Ariz. He is one of the chief exponents of organic architecture. After leaving Tech he became Frank Lloyd Wright's chief assistant and handled the liaison with clients, in addition to being responsible for working drawings, structural calculations, field supervision, and specifications. He was one of the first in our class, I am sure, to take Tubby Rogers' advice seriously, and he married Mr. Wright's daughter, Svetlana. They had two children before Mrs. Peters died in an automobile accident in 1947. Among the many varied projects and buildings William Peters has designed are the Keystone Towers in Phoenix, the Lincoln Income Life Insurance Building of Louisville, the Snowflake Motel of St. Joseph, Mich., the Kentuckiana Children's Chiropractic Center, the Phi Delta Theta Fraternity House of Arizona State University, and a Lutheran Church near Scottsdale. New projects in the works include: Court of the Seven Seas near Santa Cruz, Calif., a magnificent hotel for the Kona Coast of Hawaii, and the extensive civic center for Indianapolis. As a hobby he raises Hereford beef cattle, hunting hawks and Irish Wolfhounds.

Among the news from here and there **Ham Dow** writes: "Not much news to report hereabouts since moving back from the Hub area. I did get back to Quincy for the commissioning of the Navy's first nuclear-powered destroyer 'Bainbridge' last October and managed to enjoy a short trip aboard." . . . The appointment of **Henry S. Young, Jr.** as staff scientist is announced by the president of Brooks & Perkins, Inc., Detroit producer and fabricator of light metals in aerospace assemblies and industrial products. In the missile and space field Henry Young pioneered and directed the development branch of the Chrysler Missile Division and was at Redstone Arsenal during the past six years. . . . **Bernie Nelson,** our Class Vice-president, is struggling with computers at New York Telephone Company. His daughter, Debbie, 19, is a sophomore at Wells College while Betsy, 12, attends a private Episcopal school. . . . **Gerry Golden**'s son Peter, 19, is a B.U. freshman in the School of Applied Arts and daughter Meredith, 15, is at Walnut Hill. Jonathan, 5, Pamela, 3, and new baby (by the time these notes are published) are keeping mother busy at home. Gerry reports seeing **Elmer Gott** who is in the Research Department of the Dewey and Almy Division of W. R. Grace. . . . **Pete Grant**'s son is finishing his freshman year at M.I.T., reports Bernie Nelson, who saw Pete at the Silver Stein dinner in N.Y.C. . . . **Bob Forster**'s son, Robert Douglas, is graduating from the Naval Academy at Annapolis this June. . . . Leo Beckwith's two daughters Lolo, 13, and Carol, 17, are at Beaver Country Day School. . . . **Carl Lavenas** is moving to Mexico City from Oklahoma City this June and working with the same company. . . . **Jack Holley**'s new address is 2616 W. Orange Thorpe, Fullerton, Calif. . . . **Cornelius J. Wilson** has moved from Providence to 66 Birchwood Way, East Greenwich, R.I. . . . The Third Annual Class Golf Tournament is under way.—**Allan Q. Mowatt,** Secretary, 11 Castle Road, Lexington 73, Mass.; Regional Secretaries: **Edward C. Edgar,** Kerry Lane, Chappaqua, N.Y.; **Hal L. Bemis,** 510 Avonwood Road, Haverford, Pa.; **Edward J. Collins,** 904 Merchandise Mart, Chicago 54, Ill.; **Gerald C. Rich,** 105 Pasatiempo Drive, Santa Cruz, Calif.

'36

The Institute reports that Frederick A. Prahl, 3d, son of our **Frederick Prahl, Jr.,** was a co-author of this years Tech Show "Sins and Needles," a lighthearted song and dance story of nurses, orderlies and a mischievous furnace stoker. The younger Fred is a senior in mechanical engineering and was one of three who cooperated on the score. . . . In the current Arthur D. Little catalog of publications is listed "Artificial Modification of Atmospheric Space Charge" an article by **Bernard Vonnegut.** . . . **Arthur Sedoff** has moved from Greenwich, Conn., to Hathaway Lane, Montville, N.J. . . . **Lea Spring** is now at 114 Washington Avenue, Crookston, Minn. . . . and Captain **Alexander Veasey** in Los Gatos, Calif. at 16181 Escohar Avenue.

. . . Rear Admiral **Ernest C. Holtzworth** is commander of the New York Naval Shipyard (Code 100, Brooklyn 1, N.Y.). . . . **Randal M. Robertson**'s new address is 6736 North 26th Street, Arlington 13, Va. . . . and **J. Allan Campbell** has moved from Montreal to the Northern Electric Company, Ltd., P.O. Box 3000, Brampton, Ontario.—**Alice H. Kimball,** Secretary, 20 Everett Avenue, Winchester, Mass.

'37

From the Hartford (Conn.) Times, we learn that **Robert A. Voegler** recently addressed the Mossup (Conn.) Lions Club. Bob, President of Megadyne Electronics, Inc. of Wauregan, was the first American businessman to have become a victim of the Communists. During the greater part of his business career he was with International Telephone and Telegraph Company as vice-president and European representative. While serving in this capacity he was arrested by the Hungarian Communist government in Budapest and became the first American imprisoned by the Communists. He was tried by a Communist court for the alleged crimes of sabotage, espionage, and conspiracy against the Communist government and sentenced to 15 years' solitary confinement, of which he served 18 months. During that time he was subject to extreme psychological and physical pressures. Through his wife's efforts and prolonged negotiations, his release was granted. Upon his return to the U.S., he devoted five years to alerting Americans to the dangers of the Communist threat to their freedom and survival. For several years he broadcast a news commentary "Voegler Views the News." He is also author of the book "I was Stalin's Prisoner," which was serialized in the Saturday Evening Post.

Glad to hear that **Curt Powell,** who has been in poor health for some time (spent most of the fall term in the hospital, is now back at work, trying to get back onto a full schedule again. Curt writes: "**George F. Cary**'s (2d) son came to M.I.T. this fall from Bowdoin College and is in his father's old department, Naval Architecture and Marine Engineering. His name is George F. Cary, 3d, and it is about time for him to hurry up and graduate from here, marry, have a son, and name his George F. Cary, 4th. George, 3d, tells me that his father, while employed at the Bath Iron Works as hull engineer (following a period with Newport News Shipbuilding and Dry Dock Company) has become very heavily involved in the Sugarloaf Mountain Corporation. This latter activity dates back to the inception of that corporation. Cary engineered most of the ski lifts and became president in 1962. He is also chairman of the Bath Planning Board and a member of the Bowdoin Alumni Council. In addition to George 3d, there are three other children: Charles, now at Bowdoin; John, who is 16; and Frances, who is a couple of years younger." . . . Another item from Curt is about **Joseph Dunning,** who graduated in aeronautical engineering: "He recently visited the Institute (I think for the first time since graduation) and saw Shatswell Ober, '16, of that department, a naval architect gone

'flighty'. Joe Dunning followed M.I.T. with a stint at Stanford where he received an engineer's degree. He then joined Douglas Aircraft Company and apparently has been with them ever since. He started in the Structures Division and is now a project engineer at the Long Beach Plant. He is married and has three children."

You might think that the jet age would make the airplane propeller as extinct as the dodo. But in Windsor Locks, Conn., a whole new generation of propellers is being developed by the Hamilton Standard division of United Aircraft Corporation. **George Rosen** has played a major role in giving propellers a new lease on life. Rosen is the company's aerodynamic and hydrodynamic chief and the inventor, in 1958, of the variable camber propeller, called the first major advance in propellers in 20 years. His confidence in the future of the propeller is based in part on the big role planned for vertical and short takeoff planes, particularly heavy-duty transports which require higher-thrust, lightweight propellers. Rosen's variable camber propeller, now being refined by the company, fills the bill. Hamilton Standard has been chosen to design and build four lightweight propellers that will be mounted inside huge ducts. The ducts will increase propeller thrust during take-off and landing, and act as wings during forward flight. . . . A note came from **Bob Rudy:** "We have just received the good news that our older son John was admitted to M.I.T. Of course he accepted and will be entering this fall with the Class of '67. One down and one to go. Johnny also won a Regents Scholarship and was a finalist in the National Merits. Joan and I are planning our summer vacation. This year it will be a tour of the Western National Parks." . . . **Robert E. Hopkins,** Professor, Institute of Optics, Rochester, N.Y., was invited recently by the M.I.T. Department of Electrical Engineering to conduct a colloquium: "Laser Demonstration of Optical Experiments: Fresnel Diffraction, Abbey Theory of Microscopic Vision, Lens Aberation, Velocity of Light."

Our class ski-enthusiast, **John Jacobs,** writes from Val d'Isere, Savoie: "I am supposed to be on my way to Gela, Sicily, for a big chemical plant start-up but somehow I have managed a gigantic 10-week goof-off, largely devoted to skiing. There has been a wonderful succession of sun drenched alpine vistas. And there is the skiing—down glaciers, through vast snow fields, past ancient hamlets and little chalet restaurants. We have skiied most of the major resorts but there is no doubt in my mind that of the many places we have been, Val d'Isere is incomparable—far and away the best skiing. On Sundays (moving day) we see something of Europe. I am able to report that the Prince of Lichtenstein has a television antenna atop the highest turret of his castle. Later, we expect to climb Stromboli and climb and ski at Aetna. Betty loves it all. Especially dancing in the evening. Do not expect to return to Boston until late summer or early fall."—**Robert H. Thorson,** Secretary, 506 Riverside Avenue, Medford, Mass.; Professor **S. Curtis Powell,** Assistant Secretary, Room 5-325, M.I.T., Cambridge, Mass.; **Jerome Salny,** Assistant Secretary, Egbert Hill, Morristown, N.J.

'39

During a routine visit to the New York office of Boeing's Public Relations office, in April, I happened to ask about **Richards L. Loesch, Jr.,** IX-B, and to my pleasant surprise was given a current news-release packet which included news of Dix. The news item concerns the initial flight of Boeing's new three-engine 727 jet airliner, on which Dix served as co-pilot. As you may remember, Dix is chief of flight test for the Boeing Company. He served as a U.S. Navy fighter pilot and in the Navy's Bureau of Aeronautics during World War II. He joined Boeing in 1946 as an aerodynamicist, and transferred to the company's flight test department in 1949 as an experimental test pilot. (As I recollect from earlier news of Dix, he did much of the test work on the prototypes of the B-47 and B-52 airplanes.) He was co-pilot aboard the Boeing 707 prototype when it made its maiden flight test in July, 1954. He was named chief of flight test in July, 1960. Dix lives in Seattle with his wife Marjorie and two sons James, 16, and Andrew, 12. Flashback: As a fraternity brother of Dix, in Beta Theta Pi, I remember the derivation of his nickname: From the pluralized version of "Richards" to "Dicks" or "Dix" was an easy and logical transition!

The subject of the particular Boeing news release that I have quoted, the new 727 airplane, is the model designed to bring jet age service to many smaller cities throughout the world. Fully loaded and grossing 142,000 pounds, the 727 requires only a 3500-foot ground roll before lift-off. It is designed to handle 70 passengers in all-first-class seating, 114 in all-tourist accommodations, or 94 in a combination class configuration. . . . While on the subject of Boeing, you will be interested to learn, as I did when referencing these notes, that out of the hundreds of M.I.T. men listed in the geographical section of the Alumni Register, as living in Seattle only five other '39ers are included: **James W. Barton,** XV; **Hans Bebie,** XVI; **George A. Parker, Jr.,** II; **Richard H. Wakefield,** XV; and **Holden W. Withington,** XVI. Here's a challenge to these classmates: send along a paragraph of news of yourself for inclusion in this column!

Next, for several other news items. Professor **Louis D. Smullin,** VI, was the chairman of the Fifth Annual Electron Beam Symposium, held in Boston in March. Louis was written up in this column also in June and in July, 1962, in connection with the remarkable laser project of contacting the moon. And my memory tells me that he was featured in the pages of 'LIFE' magazine several weeks ago in a color story about the development of the laser; do you remember the ruby-red photographs of the laser? I had cut out the article, intending it for this column, but my 14-year-old daughter commandeered the clipping for a school science project with the avowed intentions of returning it promptly! . . . **John A. West, Jr.,** IX-A, is president of his own firm, the Westplex Corporation, a plastics injection molding firm which employs over 100 people, in Manchester, N.Y., southwest of Rochester. John was written up in the 'Shortsville Enterprise' as an example of an entrepreneur who had recently relocated his plant to the small village of Manchester. An open house had been held on February 17. Also mentioned in the news clipping was **Maynard K. Drury,** XV, President of Dryad Die Casting Corporation, also of Manchester. He had opened his plant in Manchester two years earlier, and was a prime mover in interesting Westplex in making their move. . . . From a brochure by the firm of Youngquist and Johnson, comes this material on **Robertson Youngquist,** II, 1500 Massachusetts Avenue, N. W., Washington 5, D. C. Bob's firm handles professional services to management, including studies, surveys, research evaluations, and consultations, in technology and in the social sciences. Bob's thesis subject at M.I.T. was liquid rocket motor design and testing; this subject was the springboard for an interesting career in rocketry. From 1941 through late 1945 he was a member of the Annapolis Rocket Project at the U.S. Naval Engineering Experiment Station, working on rocket propulsion for flying boat assist-take-off (JATO) and on the Gorgon and Lark missiles. Later, until his release from active duty (with the rank of lieutenant, USNR) in 1946, Bob served in the Powerplants Division of the Bureau of Aeronautics, administering the rocket engine development contract for the X-1 research aircraft.

Bob's career then took him to the newly-formed Pilotless Aircraft Section of the Glenn L. Martin Company, (1946 to 1949) and to Reaction Motors, Inc., (1949 to 1957) both with important rocket assignments. In 1958 he joined the Institute for Defense Analyses, a non-profit organization under contract to the Office of Secretary of Defense, working on space programs. He holds several patents in the rocket field, and has published many papers.—**Oswald Stewart,** Secretary, 31 Birch Road, Darien, Conn.

'40

Herb Hollomon, on March 29, spoke on "Economic, Political and Sociological Implications of Expanding Space and Scientific Knowledge" at the Fifth Plenary Session of the Space, Science and Urban Life Conference held at Dunsmuir House, Oakland, Calif. . . . **Clinton Powell** is the head of the newest of the National Institutes of Health. Clint is in charge of the National Institute of General Medical Sciences. Previously, the new institute was a division of N.I.H. . . . Brigadier General **David Parker** is in charge of the U.S. Army's 5,829 aircraft and 7,000 pilots. Dave is commanding officer of the transportation materiel

command. He directs both civil service and regular army personnel of 3,000 in St. Louis. His operation does about $500,000,000 worth of business a year. Its biggest customers at the moment are in South Viet Nam manning U.S. Army helicopters. . . . Your secretary had a pleasant stay in Palm Beach the end of March while taking depositions. Unfortunately, the sun was only out one day during the week he was there, and consequently, no suntan.—**Alvin Guttag,** Secretary, Cushman, Darby and Cushman, American Security Building, Washington 5, D.C.; **Samuel A. Goldblith,** Assistant Secretary, Department of Food Technology, M.I.T., Cambridge 39, Mass.

'41

After two meetings, April 2 and 18 respectively, of your committee at the kind invitation of **Mitchell J. Marcus,** it was decided to have the 1962 Spring Get-Together for the New England Area at Mitch's home in West Newton, with the time scheduled for the end of April. You will note by the dates, this affair will be past history by the time you read this. However, as this is being written we are looking forward to an enjoyable evening in the relaxing atmosphere of a Boston suburb. Those active in attending the early April meetings and planning this gala affair were Edward R. Marden, D. Reid Weedon, Jr., John H. MacLeod, Jr., Mitchell J. Marcus, Everett R. Ackerson, and Walt Kreske.

Particularly to those of you who still feel young enough to aspire to start a business, and as a matter of general interest to the rest of you, the following news article concerning the late **Bill Ahrendt** is being copied verbatim. The article appeared in the Washington Post and is dated September 9, 1956, under the caption of "Case of Mistaken Identity Launched Ahrendt Firm." It has been thoughtfully sent to us by the secretary of Bill's estate. It reads as follows: "A case of mistaken identity launched the meteoric business career of William R. Ahrendt—engineer, instructor, author and 36-year-old president of a firm with annual sales of $2 million. It happened in 1947 when Ahrendt was a project engineer on automatic controls with the Navy Department. He was a bright young man but not particularly distinguishable from hundreds of other equally bright young government engineers. One night Ahrendt was invited to deliver a lecture before the American Institute of Electrical Engineers. His introduction apparently was garbled because one member of the audience, thinking him an independent consultant, asked later whether he could undertake a special project. This was to devise a control system that would keep a 50-foot diameter antenna positioned on a star. The scheme was "harebrained," Ahrendt recalls now with a grin, but it convinced him there were limitless opportunities in automatic control engineering. Later that year he invested $10,000 in a two-room office on Kennedy Street, N.W., named it the Ahrendt Instrument Company, and promptly landed a $50,000-government contract for classified design work. At the beginning, according to the firm's brochure, 'belief in the company was the major asset, and the purchase of a Sears-Roebuck drill press the subject of a top-level conference.' Things change and Ahrendt's firm changed faster than most. In March, 1949, it was already a 40 by 60 foot building at 4910 Calvert Road, College Park, Md. Now, after four expansions, the company's home is a 36,000-square-foot low-slung red-brick building completely air-conditioned and dust-controlled and crammed with the latest Swiss and American precision machinery. Most of the company's work today is for the Defense Department.

"In 1951 the Navy recommended to Bausch and Lomb that it farm out to Ahrendt the servomechanism for a fire control telescope that had to be more accurate than the Navy had ever required before. Many of the firm's products are developed by its own engineers. Fifty of the 175 employees work in research, development and design. The only commercial product, which the company developed and on which it has an exclusive patent, is an automatic seriograph. This is an auxiliary to an X-ray machine used to detect brain and heart tumors. It takes pictures in rapid succession of a fluid opaque to X-rays that is injected into the blood stream. The tumor is located when the fluid follows an abnormal course.

At M.I.T., where Ahrendt was an honor student, he played trombone in the band, pulled Number 3 oar in the crew and ran the student laundry. For the past decade he has taught part-time at the University of Maryland's School of Engineering. He has co-authored a book, 'Automatic Feedback Control,' and published 'Servomechanism Practice' in 1954. Last year Ahrendt led his company into a happy marriage with Litton Industries of Beverly Hills, California. One purpose of the merger was to nullify some of the risks of one-man ownership for his family (a wife and three children) and for his employees." . . . Please send news items promptly to any one of the secretaries for publication in this column.—**Walter J. Kreske,** Secretary, 53 State Street, Boston, Mass.; **Henry Avery,** Assistant Secretary, 169 Mohawk Drive, Pittsburgh 28, Pa.; **Everett R. Ackerson,** Assistant Secretary, 16 Vernon Street, South Braintree 85, Mass.

'43

Frank E. Briber, Jr., manager of the Allis-Chalmers cement industry department, was appointed chairman of the National Crushed Stone Association's Manufacturer's Division in January. Well known in mining and metallurgy circles, Frank joined Allis-Chalmers in 1946 after three years in the Navy, and held managerial positions in the processing machinery departments. He and his wife and their two children live in Fox Point, Wis. . . . Dr. **William A. Selke,** Director of Research at Peter J. Schweitzer Division, Kimberly-Clark Corporation in Lee, Mass., was the luncheon speaker at the Worcester Polytechnic Institute's seventh "Scientific Briefing for Tomorrow" in April. After receiving his S.B. and S.M. from Tech, Bill received his doctoral degree at Yale, and was an assistant professor of chemical engineering at Columbia, joining Schweitzer in 1955. . . . These notes will reach you just prior to the 20th Reunion at the Mayflower Hotel in Plymouth, Mass., June 7 through 9, 1963.—**Richard M. Feingold,** Secretary, 10 North Main Street, West Hartford 7, Conn.

'44

This will no doubt see the light of day just about Alumni Day time in June. Since I presently expect to be in Cambridge at that time, I hope that I will be able to see all of you who happen to be there. I find that Alumni Day is always quite pleasant, and a source of much class news. . . . A note came in from **Bill Rodemann,** VI, which I shall quote: "On returning to Cleveland and home I realized I still have your Christmas card note on the back of my desk with request for dope for the notes. Let me say that next time I come through New York I hope to stay at the M.I.T. Club at the Biltmore and will contact you. The plastics business in which I invested, Swiftwater Industries, Inc., Chagrin Falls, Ohio, is now doing very well. It is completely out of the boat business (overcapacity, price-cutting) and completely in industrial fiberglass products, mainly filament-wound chemical storage and mixing tanks, and other hoods, tanks, and duct-work for corrosive fume removal. As you probably know, Emily, the family and I just returned from two-and-a-half years in Europe on consulting assignments. We lived in London most of the time. The work was with I. T. & T., who have plants in 14 of the countries there."

Bill also mentioned his friend **Holton Harris,** IV. I called Holton, and we had lunch together. He is president of Harrell, Inc., which is in the business of manufacturing extremely accurate temperature controllers. Holton moved up to Norwalk, Conn., about a year ago from New York, where his company was established several years ago. Holton lives here in Westport, and I understand he and Jean are great bridge players—bordering on the duplicate level! . . . While looking around for some new contacts for the column, I called **Eric Wunsch,** who is general manager of Silent Hoist and Crane in Brooklyn. He says that his firm specializes in the larger equipment, starting where most of the commercial firms leave off. He has been active in the development of a number of devices for quicker loading and unloading of ships. Eric says that cranes in the 6,000 to 100,000 category are his specialty. He says that he has run into Mike Lagana, '47, on numerous occasions. Mike is a vice-president of Kuhn Smith and Harris, a construction firm in New York City. Eric, who was at the M.I.T. Club of New York cocktail party, said that as a result

he got to see **Bob Meny,** V, **Al Corona,** IX, and **Jay Martin,** XVI, all of whom are with Socony Mobil Oil in New York.

A call to **Walter Hobbs,** XV, who was with our class during more-troubled times for a short while, indicates that he is advertising manager for the A. M. F. Bakery Machinery Division in New York City. The Hobbs family, which includes four children, calls Mineola, Long Island, home. . . . I talked to **Clyde Snyder,** XV, who is with United Corporation, a closed-end investment trust. He has been with the company for about a year now, and it seems that he has been increasing his scope by taking on more and more industries to analyze; now in addition to specific industries he has an analysis of general economic conditions to keep up to date. He gets over to the M.I.T. Club in New York occasionally, but to date hasn't run into any of the '44 men. —**P. M. Heilman,** Secretary, 30 Ellery Lane, Westport, Conn.

'46

The sparse news this month concerns graduate members of our class. **Cathleen S. Morawetz,** Professor at New York University, recently spoke at an M.I.T. applied mathematics and mechanics colloquium on "Magnetohydrodynamic Shock Structure." . . . **Thomas F. Malone,** Director of Research, Travelers Insurance Company, has been appointed a member of the Science Information Council, a 15-man group established under provisions of the National Defense Education Act of 1958 as advisory to the National Science Foundation, Office of Science Information Service. . . . **Pearson H. Stewart** is vice-president, planning, Research Triangle Park, and executive director, Research Triangle Regional Planning Commission of the Chapel Hill, Durham, and Raleigh areas of North Carolina. In addition, he is currently president of the Southeast Chapter, American Institute of Planners; Lecturer at the Department of City and Regional Planning, University of North Carolina; member of the North Carolina State Planning Commission; member of the Heritage Square Commission; and member of the North Carolina Recreation Commission. Pearson, Jean, and their two children recently moved into their new home at 112 Glendale Drive, Chapel Hill, N.C. . . . New addresses: **Russell A. Foust, Jr.** has moved from Pennsylvania to 5753 North Alton Drive., Indianapolis; **Rodman Jenkins** has left Los Angeles to join IBM Corporation, 555 Madison Avenue, New York 22, N.Y.; **C. Townsend Wilson, 3d,** now uses Box 2, Buffalo 22, N.Y., as a mailing address. —**John A. Maynard,** Secretary, 25 Pheasant Lane, North Oaks, St. Paul 10, Minn.

'47

Having returned from a cruise to Nassau, I discovered an accumulation of class news in my mailbox including . . . **Donald M. Van Greenby,** President and Treasurer of the Van Greenby Realty Trust, estimates that he has built over 1,000 homes in the Greater Lowell area and is still going strong. . . . **Eli Perry** has been appointed research associate at the Chemstrand Research Center, Durham, N.C. . . . **Herbert L. Schmidlin** has been appointed resident manager of the Manhattan Rubber Manufacturing Company plant in Neenah, Wis. . . . **Francis E. Swain,** Chief, Automatic Data Processing Branch, U. S. Bureau of Reclamation, spoke at a Department of Civil Engineering seminar on "Application of Computers to Hydraulic and Hydrologic Problems." . . . **Hrand Saxenian** developed an advanced hotel management program as a consultant to the Boston Statler Hilton Hotel. . . . **John F. Dimodica** was appointed supervisor of industrial engineering at the Strathmore Paper Company plants in the Springfield, Mass., area. . . . **Ezra S. Krendel** has been named technical director of the Franklin Institute of Philadelphia, Operations Research Division. . . . The following address changes have been received from members of the class: Dr. **Robert P. Epple,** 10301 Kendall Road Potomac, Md.; **George L. Fichterbaum,** 157 Rose Lane, New Hyde Park, N. Y.; **Rufus M. Franklin,** 54 Centerwood Drive, Holden, Mass.; **Dieter Goetze,** 15904 South Eden Drive, Hopkins, Minn.; **Robert L. Greene,** 7447 Stonecrest, Dallas, Texas; **Burt B. Lasko,** 1211 Linden Avenue, Highland Park, Ill.; **Leroy Oberholtzer,** Borg-Warner Corporation, Washington, W. Va.; **William F. Osborne,** Nuevo Leon 10, Celaya Gt, Mexico; **George H. Sprague, Jr.,** 2608 Lando Lane, Orlando, Fla.; **Richard E. Wildermuth,** 120 Kilburn Road, Garden City, N. Y.; **Arthur J. Zito,** 226 Almur Lane, Wynnewood, Pa.; Dr. **Donald E. Boynton,** Hercules Powder Company, Magna, Utah; **William J. Bursnall,** 3720 E. Quarles Avenue, Littleton, Colo.; **Harry L. Cavanagh,** 102-2nd Avenue, Ioco, B. C., Canada; **Raymond Chung,** 606 Knight Avenue, Neenah, Wis.; **Norman L. Daggett,** 9 Burroughs Road, Lexington, Mass.; **Emmett T. Craig,** 11726 Memorial Drive, Houston, Texas; **Charles F. Brodersen,** Detroit Institute of Technology, 131 East Adams, Detroit, Mich.; Dr. **Henry L. Lee,** 745 Sierra Madree Building, San Marino, Calif.; **Edward L. Ghormley,** 521 Lola Drive, Louisville, Ky.; **Joseph L. Espy,** American Baptist Mission, Lancashire Road, Kowloon, Hong Kong.—**Martin M. Phillips,** Secretary, c/o Tyco, Inc., Hickory Drive, Waltham 54, Mass.

'48

A letter from **Dave Freedman** in January had this to say: "Since graduating as an electrical engineer in 1948, I have been fortunate enough to have done very well in, of all things, the bakery business. I have developed my father's small local bakery into one of the largest in Eastern Massachusetts. My wife, Beverly, and I have three lovely children—Donald, 15, Daniel, 11, and Judith, 8. Our home is on Crystal Lake, Newton Highlands. . . . **Manuel Kramer,** from our class, is living in nearby Lincoln, Mass., in a home that he built with his own hands, for the most part. His wife Ruth just had their fourth child and third son. Manny is one of the project directors at M.I.T.'s research labs. . . . **Seymour Rock** also lives in nearby West Newton, and I think he is in insurance." Dave's address is 20 Rogers Street, Newton Highlands 61. . . . The Class of '48 had a 'pilot' 15th Reunion in Florida back in March involving Ben Brettler, Bill Katz, Dennis Allegretti, and Hal Field, as well as their wives, and one other couple who will remain nameless for the moment in order not to spoil Ben's story as reported by letter to **Dick Harris:** "While vacationing with my wife in Florida last week and enjoying some gamboling [sic] at the local Jai-a-lai, I encountered a minor class reunion at the $2 window. After hoisting one for old times we were surprised to note a swarthy Basque in the fourth match by the name of Sojo Adelstein. The resemblance to **S. J. Adelstein** was inspiring but cost us four times two dollars.

"The next evening while frolicking at one of Miami Beach's edifices (The Fontainbleau) we heard them paging Dr. Stan Adelstein. Stan and his wife Mary have a three-month-old son; Stan claims to be very busy watching over his flock of animals at the Harvard Medical School, but we wonder." . . . You may have noticed the account in the March issue of **Ken Brock**'s joining the staff of the Alumni Fund. Ken will assist with reunion gift work and have primary responsibility for the development of programs to obtain special gifts on a regional basis. . . . Also from the pages of recent issues, we have news of the appointment of **Dick Harris** as a trustee of the People's Savings Bank, Worcester, and the appointment of **Guilford L. Spencer, 2d,** as chairman of the Mathematics Department of Williams College. . . . **John Fries, Bob Carruthers,** and **John Kellogg** have organized the new corporation, Nutmeg Steel Castings Corporation of Branford, Conn. This was formerly the Nutmeg Crucible Steel Company, a medium-sized job foundry serving the machine tool industry. Death prevented the owner from completing a modernization and expansion program. The three '48ers report that a sound financial plan was conceived that would permit the modernization to be completed. The new corporation will be approximately seven months old by the time you read this. . . . Dr. **Albert J. Kelley** was to be the guest speaker at the spring meeting of the M.I.T. Club of Northern New Jersey. Dr. Kelley is director, electronics and control, Office of Advanced Research and Technology, NASA. He spoke on the total program of NASA, which organization he joined on March 1, 1960, as Agena Launch Vehicle Program manager. . . . Professor **William D. Stahlman** of the University of Wisconsin lectured on early astronomical methods March 11 in the Hayden Library Lounge. Professor Stahlman was graduated from Tech in mathematics and was on the faculty from 1955 to 1960. He is professor of history of sci-

ence at the University of Wisconsin, and has finished two books on early astronomy which will be published this spring. . . . Dr. **John R. Lamarsh,** Associate Professor of Nuclear Engineering, directs the first undergraduate program in this field to be offered by New York University's College of Engineering. Professor Lamarsh came to N.Y.U. in September, 1962, with more than 10 years of professional experience in the field of nuclear engineering. He has served as a consultant on nuclear weapons problems and with the Brookhaven National Laboratory and the Shielding Board of the Oak Ridge National Laboratory. Before coming to N.Y.U. he was a faculty member at Cornell for four years.—**Robert R. Mott,** Assistant Secretary, Box 113, Hebron, Maine; **Richard H. Harris,** Secretary, 26 South Street, Grafton, Mass.; **Harry G. Jones,** Assistant Secretary, 94 Oregon Avenue, Bronxville, N.Y.; **Herbert S. Kindler,** Assistant Secretary, 128 Elatan Drive, Pittsburgh, Pa.

'49

While **Frank Hulswit** resides in London, England for the next year or so, **Russ Cox** has asked the undersigned to cover some of the stateside happenings which otherwise might escape Frank's vigilant eye. So here goes. A Cocktail Party for '49ers and their wives or husbands is planned for Alumni Day, Monday, June 10 from 4:30 to 6:15 P.M. **George McQueen** is running the affair, which will be held, as it was last year, in the Faculty Club on the sixth floor of the School of Industrial Management. $3.00 per person covers the cost of all you can eat and drink. **Tom Toohy,** former class president, and his wife have been invited to attend as guests of honor. Movies and slides taken at our 5th and 10th reunions will be shown. . . . The 15th Reunion Committee is hard at work on plans for next year's affair. The site on Cape Cod has been selected and a contract signed. **Stan Margolin** and **Wally Row** are co-chairmen for the event which will take place from Friday, June 12 though Sunday, June 14, 1964. If you enjoyed our 10th or heard what a smashing success it was, plan early to be at the 15th. It will be a real blast!

Kemon Taschioglou and his charming wife, the former Rhoda Kyser, are the delighted parents of a baby girl, Ellen Cooper, born January 29, 1963. Kemon is director of marketing for Image Instruments Company in Newton Lower Falls, Mass. They make video storage and processing devices, some of which go into satellites. . . . **Russell Cox** has formed his own company, Linnell and Cox, Inc. Until recently, Russ was vice-president and general manager of Cabot, Cabot, and Forbes, industrial realtors. He will continue in the field of real estate investment and development with headquarters in Boston.—**Frank T. Hulswit,** Secretary, 53, Albert Hall Mansions, London, S.W. 1, England; **Fletcher Eaton,** Assistant Secretary, 83 Herrick Road, Newton Centre 59, Mass.

'50

In conjunction with Benjamin J. Leon, '57, your classmate, **Rui P. de Figueiredo,** will attempt to translate "pure" mathematical concepts into engineering terms. One potential result of the new product, which will analyze the engineering problems posed by nonlinear circuits and systems, could be the design of improved military and consumer equipment; for example, smaller, more sensitive television sets at lower cost, and lighter-weight, more reliable radio and radar for spaceships. These improvements might be effected, it is believed, if engineers could incorporate more solid-state devices, such as transistors and recently developed varactor diodes, in the design of old fashioned electrical circuits. . . . **Fred A. Tough** was recently promoted by the Ohio Rubber Company, from marketing services director to manager, PFE sales. . . . **Edward J. Hayes** has been appointed director of engineering and research for the Kelsey-Hayes Company, Romulus, Mich. Prior to joining the company in April, 1958, Ed served as a senior staff member of John Hopkins University in the controls group, managing the applied mechanics and hydraulic activities.

John E. Ertel was named plant manager of Pantasote Company. John joined Pantasote in 1956 as manager of the company's Eleonora Chemical Division, a post in which he served until April, 1962, when he was named production manager of the resin, film and compound divisions. Pantasote is a major manufacturer of polyvinyl resins and compounds, PVC film and sheeting, and Panta-Pak packaging trays. . . . I have the following address changes: **Bradford T. Joyce,** Hayward Mill Road, West Concord, Mass.; **Paul A. Lobo,** Continental Oil Company, P. O. Box 1207, Rotterdam, The Netherlands; **Gerald Peretsman,** 55 Tain Drive, Great Neck, N.Y.; **Andrew Price, 3d,** 24 Leonard Crescent, Penfield, N.Y.; Captain **Kenneth A. Sawyer,** 2015 D. Seneca Street, Leavenworth, Kansas; **Sterling G. Brisbin,** 97 Lincklaen Street, Cazenovia, N.Y.; **Thomas C. Cerwonka,** 119 Emerson Street, Kingston, N.Y.; Major **William C. Fuller,** Office, Chief of Ordnance, Washington 25, D. C.; **William J. Gallagher, Jr.,** 3825 Carriage Road, Birmingham, Mich.; **W. Lawrence Gates,** the Travelers Research Center, 650 Main Street, Hartford 3, Conn.; Major **Frederick L. Hafer,** 330 Dogwood, Park Forest, Ill.; **Theodore P. Harding,** Chapman Ridge Road, Athen, Maine; **William B. McGorum, Jr.,** 2851 Landon Drive, Cuyahoga Falls, Ohio.—**Gabriel N. Stilian,** Secretary, American Management Association, 1515 Broadway, New York 36, N.Y.

'55

A very nice note was received from Mrs. **Harlan M. Walker** bringing us up to date on their activities. Lois and Hal were married on February 2, 1963, and are now living in Los Angeles, Calif. Lois is a graduate of the University of Colorado School of Nursing and is now employed as an industrial nurse with Douglas Aircraft Company in El Segundo. Hal is a process engineer with Weber Aircraft Corporation in Burbank. . . . A recent communication from **P. S. Subramaniam** probably qualifies him for a new class record. He and wife, Syamala, are the parents of 5 (we repeat, five) children—3 boys and 2 girls. Can anyone top that? They are presently living in Kerala, India, where he is a professor and head of the Mechanical Engineering Department of the Regional Engineering College, Calicut-5. . . . At the Fifth Electron Beam Symposium held in Boston last March, **Marsbed Hablanian** delivered a paper, "A Correlation of Welding Variables." Marsbed is chief development engineer at N. R. C. Equipment Corporation in Newton Highlands. . . . At the same conference, **Sheldon S. White** presented a dissertation on "The Influence of Gas Content on Crack Propagation Energy." Sheldon is with Alloyd Electronics Corporation in Cambridge.

A feature article appeared in January in the 'Malden News' about **Daniel L. Brown** who is manager of the Bionomics Section of Ionics, Inc., of Cambridge. Dan has been in charge of development of a new water reclamation system that may well solve the problem of providing drinking water for astronauts during long space flights. Dan and Louise live in Wayland and have a daughter, Jennifer Sue, who is two years old. . . . **Mel Barkan** completed a European trip in April that took him to Spain, Majorca, France, Italy, England, and Denmark. He commented that now he knows why the fellow wrote the song, "April in Paris." See you again next month.—Co-Secretaries: Mrs. **J. H. Venarde,** 2401 Brae Road, Arden, Wilmington 3, Del.; **L. Dennis Shapiro,** Aerospace Research, Inc., 130 Lincoln Street, Brighton 35, Mass.

'56

At the March meeting of the Boston Chapter of the I.R.E., **Gordon Bell** of Digital Equipment Corporation participated in a program on "Completely Programmed Input-Output Operation." Gordon was a Fulbright scholar during 1957-58, worked at the Tech Research Laboratory for Electronics, and joined Digital Equipment as a Computer Design Engineer in 1960. . . . **Roger Borovoy** has become secretary-treasurer of the Club of Northern California. . . . **Marty Chetron** is the treasurer of the Southern California Club. . . . **Jimmie Chin** is secretary of the M.I.T. Club of Long Island. . . . **Al Dovman** is an industrial engineer with Anaconda Cable and Wire. **Dave Seidman** is with Penn-Jersey Planning Corporation, an organization concerned with urban renewal. . . . **Sam Wiegand** is with the EDP Division of Minneapolis-Honeywell in Los Angeles. . . . **Dick** and Virginia **Johnson** announce the birth of a daughter, Catherine Patricia, who arrived on March 25. . . . **Bill Peter** writes

that he is a technical supervisor working on lycra spandex fiber at DuPont in Waynesboro, Va. Bill and Dottie have two boys and a girl. . . . **Mike Turin** has written that he received a master's in 1957 from the S.I.M. and then went to work for IBM in New York. He has worked in the Applied Science Department, Sales and now is in World Trade. Mike and Phyllis have two sons, Howard and David.—**Bruce B. Bredehoft,** Secretary, 1094 Center Street, Newton Center 59, Mass.

'57

In reply to a letter requesting news, **Bob Rosin** forwarded the following note: "I'm getting married to Rosalie Lite on April 7 in St. Louis. Rosalie went to Northwestern ('61). We will live in Ann Arbor while I continue to consume large quantities of computer time and soul warming beverages in pursuit of my degree in the communication sciences program. After that we hope to go East." . . . **Bill Salmon** has a very interesting job in Washington. He writes as follows: "I have been here in Washington for two years in essentially the same job. I started with the Office of the Science Adviser in a six-man shop under Walt Whitman ('17) (Course X chief) who was Science Adviser to the Secretary of State. Last September Walt chose to retire as the activity became a bureau and took on a new name—the Office of International Scientific Affairs. Our director at present is Raznar Rollefson, head of the Physics Department at Wisconsin. By gaining new people and merging with another office, the group now includes 20 people in D.C. and about a like number overseas in scientific attaché capacities. The office functions in many ways at the interface of science and U.S. foreign policy. The U.S. Government is quite active in science activities overseas and there is a need to advise the policy making machinery of the U. S. of the effect of these activities—both of likely problems and particular situations where these activities may be of assistance to our foreign policy objectives. I find myself involved in all phases of the office's work: coordination of science programs using U. S.-owned foreign currencies (under P.L. 480), the clearance of grants to foreign researchers, assistance to Rollefson, etc. I have had an opportunity to do a bit of traveling in the eastern Mediterranean area and Western Europe and through our "show places"—NORAD, SAC, the "Cape" and Grand Turk Island. Probably when your readers note this activity I will be eating some sand in Cairo or New Delhi. The travel is a by-product, but greatly enjoyed. Other than work there is the seemingly-never-ending Army reserve stuff. I have joined an amateur hockey team and played in games here in D.C. and in cities as far north as Asbury, N.J. The women? Well, plenty, but not too many are overly endowed with gray matter."

Al May recently filled me in on some news about fellows in the New York area. **Jules Byron,** I learned, is doing very well in the real estate field. . . . **Dave Wolsk** has joined Pyrotel as an applications engineer. The firm manufactures optical infrared pyrometers. . . . **Don Park,** after receiving his M.B.A. from Tech in 1962, has returned to Ingersoll Rand at Painted Post, N.Y. . . . Lastly, **Art Shultz** is now in the controller's office of West Virginia Pulp and Paper in Manhattan.

This summer I will be worrying on Wall Street for Carl M. Loeb, Rhoades and Company. If any of you are in New York, give me a call there. Possibly we can get together for a chat. The way it looks now (i.e. with exams coming up here and no news in hand or on the horizon) I will not be writing a column for the July issue. Early in August I plan to get out a mailing to everyone in the class requesting information. I hope all of you will reply.—**Frederick L. Morefield,** Secretary, 17 Everett Street, Cambridge, Mass.

'58

These are the last notes before the reunion. As I sit here in April writing them, I wonder if you are coming. If you aren't, I certainly expect to see you in 1968. . . . **Bob deJong** writes that he will be in England for a few more years. Last May he married **Lorna Gibson** in Scotland and is now living in East Malling, Kent. . . . Another classmate has joined the Peace Corps—**John Wills** is off to Nigeria. John was formerly working for G.E. in Lynn, Mass., as a development engineer. . . . **John Boynton** got a big spread in the Bangor, Maine, newspaper about his activities at NASA in Houston, Texas, where he is a senior editor of publications dealing with manned space flights. He left General Dynamics in San Diego to join NASA in the spring of 1962 and headed up the report on Wally Shirra's orbital flight as well as Scott Carpenter's flight. . . . A young lady named Jane Bower Stephens finally hooked **John O'Brien** in Santa Monica in February. . . . **Mel Copen** has left the country for a two-year stay in India where he is working for the Institute of International Education while writing his thesis. This is a Ford Foundation project to establish an Indian Institute of Management in Ahmedabad, similar to M.I.T.'s project in Calcutta. . . . **Dave Cohen** is married to the former Barbara Stavis and they have three children: Amy Ruth, 5, Deborah Susan, 2½, and Joshua Louis, 1. Dave is working in quality assurance at Litton Systems, Inc., in Woodland Hills, Calif., and is an active member of the West Coast reunion committee.

Daryl Wyckoff is married to Val Abdou and is the father of the very rambunctious Michel, age 2. He is assistant to the vice-president of Cosmodyne, a cryogenic firm in Los Angeles where he puts his VooDoo art experience to good use in advertising, proposals, etc. He is also doing wonderful work on the committee. . . . **Al Jarnigan** married Thelma Warner and has a son, Warner Alan, born last August. He is living in San Carlos, Calif., where he is assistant plant manager of M & T Chemicals, a division of American Can. As the northern representative of the West Coast committee, he has done much research work on restaurants, night clubs, etc., for the reunion. . . . We all feel with deepest regret the death of **Joseph E. Rose** on November 12, 1962, from an auto accident.—**Cornelius Peterson,** Secretary, 4 Rambling Brook Road, Upper Saddle River, N. J.; **Antonia D. Schuman,** Western Associate, 22400 Napa St., Canoga Park, Calif.; **Kenneth Auer,** Midwestern Associate, 12955 Harlon Avenue, Lakewood, Ohio; **William G. Daly, Jr.,** Eastern Associate, 10 Angier Road, Lexington, Mass.

'59

My faith in the Class of '59 has been temporarily restored. Several letters arrived this month and I hope this trend continues. **Joe Goodell** writes: "After M.I.T., I went on to Harvard Business School, where I received an M.B.A. in 1961. In August of 1961 I married Missy Rives, Wellesley, '60. Since then I have been employed by the Bechtel Corporation, first in San Francisco; for the past year I have been in charge of field cost control for the construction of a $24-million nuclear power plant, the Peach Bottom Atomic Power Station. I have a daughter Marian, born in November of 1962. I have kept up with my fraternity brothers (ATO) and will relate what news I have of them. . . . **Dave Brown** spent some time working for Raytheon then returned to the Institute to get his master's degree in electrical engineering. He married Prudy Hughes, Wellesley, '60, in June of 1961. He is now working for Lockheed in Palo Alto, Calif. . . . **Dave Cook** works for the Itek Corporation in Boston. Itek has had him bouncing around the country on various errands, one of which brought him for a visit here in Maryland. He appears to be thriving on bachelor life. . . . **Stan Drozd** has been with Raytheon since graduation. He too has remained a bachelor. . . . **John Mann** got his M.S. from M.I.T. and is now working on his doctorate, interspersed with spells of employment with Itek. With considerable effort he has remained a bachelor. . . . **Joe Keller** has been working at times doing various things in the construction business in Nevada. He has also spent some time at M.I.T. working on a master's degree. He recently took time out from all this to get married to Cynthia Broadhead. . . . **John Polhemus,** after leaving Grumman on Long Island, has returned to Boston. He and his wife, Claudette, have two boys. . . . **Al Ream,** after a tour of duty with the Mormon Church, returned to M.I.T., got his degree, got married and is now at Northwestern Medical School. . . . **John Mahoney** has been working for Bethlehem Steel Company since graduation. He is now at the Sparrows Point, Md., plant. He is married to Meg Procter. . . . **Bob Stuart** worked for Aerojet General until just recently. He is now with North American Aviation in the Los Angeles

area. He has just about completed work for a master's degree in mechanical engineering. . . . I did receive a Christmas card from my thesis partner **Ed Doyle.** As I recall he is/was at M.I.T. working on his master's degree in mechanical engineering after getting married and bringing forth a child." Many thanks for the volume of news Joe. Joe's present address is 121 Wallace, Bel Air, Md.

Allen Novak writes: "I am getting married next June 29; as part of my honeymoon I plan to visit M.I.T. in order to see all the changes that have taken place since I last left Tech. Jobwise, I am working as plant engineer (for two years now) in an aluminum extrusion plant here in Lima, Peru; we specialize (almost exclusively) in toothpaste tubes, exporting most of our production; we even ship some of our production into the States. Recently we have installed a subsidiary plant in Costa Rica so as to better take care of our Central American markets. Along with this main job, I am interested stockwise in a firm importing Hughes helicopters and Beechcraft airplanes into Peru." Allen's address is PO Box 2761, Lima, Peru. Incidentally, Al, ring replacements are available through the Balfour Company only. . . . **Dave Weisberg** writes: "I am presently one of the defenders of our country. Big brother in Washington has sent me to the middle of the Arizona desert, 200 miles from civilization. Believe it or not, I am doing the same thing in the Army as I was doing in the free world—working on a computer research project. For entertainment we go across the border to Mexico for the bullfights . . . If nothing else the job has its benefits. Since we are so isolated, we go out to see the world. In the past seven months I've logged about 25,000 miles running around the country." . . . Another letter recently arrived from **Jerome Schooler.** He writes, "I am presently the president of Mica Wood Products Corporation, a recently acquired affiliate of Flush-Metal Partition Corporation. We specialize in the manufacture of plastic laminated products such as complete wall systems, tops of all kinds, toilet compartments and special custom projects. An article I wrote was published in the 'Hardware Consultant Magazine,' the October, 1962, issue, based on an address I delivered to the Construction Specifications Institute regarding toilet compartment specifications."

Many thanks for the interesting mail gentlemen. I hope this continues. I note that **Charlie Cushing** has moved to West Columbia, S.C., **Mike Brunschwig** to South Bend, Ind., and **Dick Krock** to Peabody, Mass. How about writing and telling of your new plans? . . . **Paul Norris** has been appointed design engineer in the product development department of fire protection products division of the Ansul Chemical Company. Paul was previously at Redstone Arsenal, Ala. . . . **Paul Brown** has completed the 11-week engineer officer's orientation course at Fort Belvoir. Paul is a first lieutenant with the Engineer Corps. . . . **Charles Crawford** spoke at the recent Electron Beam Symposium held at M.I.T. Charles' topic was "Mass Flow Determination by the Multiple-Crossed-Beam Technique." . . . Congratulations are in order to **Mike Intriligator.** Mike was recently married to Devrie Jane Shapiro, '62. Mike was a Woodrow Wilson Fellow at Yale, where he received his master's. He is now an instructor in economics at Tech, where he will finish his Ph.D. this year. Mike will soon be going out to UCLA as an assistant professor of economics. . . . **Harrison Morse** is presently supervisor of programming at Digital Equipment Corporation. He recently discussed his work at the Boston Chapter of IRE. I hope everyone has an enjoyable summer.—**Robert A. Muh,** Secretary, M-424 Arlington Towers, Arlington, Va.

'60

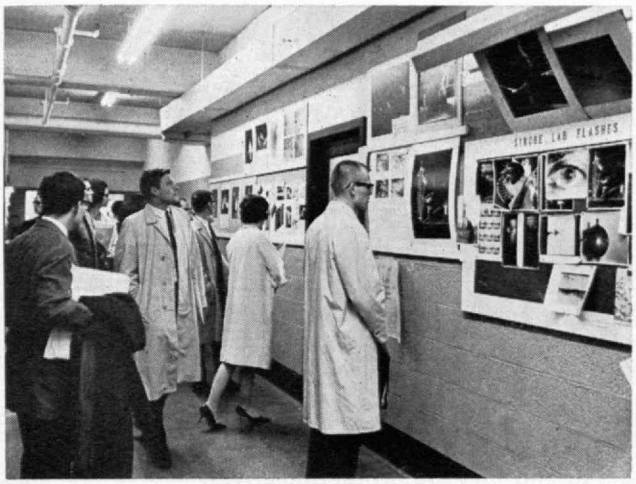
The pleas for news to fill this column brought a reply from **Bob Kerber.** He reports that he is now working on his Ph.D. in chemistry at Purdue under an NSF Co-operative Fellowship. Bob plans to finish his work in a year or so. Bob also reports the following news: **Ken Meyers** is at Harvard Law School and is receiving his degree in June. Ken was married to the former Susan Plotnick of Camden, N.J., last September. . . . **Addison Ball** is on active duty with the Signal Corps at Fort Meade. He is engaged to Patricia Ann Ammons of Hoboken, Ga. They plan a June wedding. . . . **Jack Tomlinson** is working for his doctorate in physics at the Institute. Thanks for the letter Bob. . . . I received a news clipping showing **Roger Kiley** standing over a shell casing that disappears when the shell is fired. Roger and two fellow scientists developed the casing at the Army's Picatinny Arsenal, Dover, N.J. Sounds like quite a project. That's all the news for now.—**John B. Stevenson,** Secretary, 106 Ellery Street, Cambridge 38, Mass.

'62

June—time for weddings, engagements, graduations, etc., and time to write your good ol' class secretary all about them. . . . **Tom Waltz,** XV, has left IBM and has joined the Peace Corps. He will be working in Tanganyika. . . . **Raymond Schultz,** II, who is working for General Motors, was granted a patent on a hydraulic levelizing control for vehicle suspension. . . . **Robert Simon,** VIII, has an assistantship at Rensselaer Polytechnic Institute. **Xavier Simon,** X, is at the M.I.T. chemical engineering practice school on a fellowship. . . . **Shoichi Yamanami,** II, is working at the Jujo Paper Manufacturing Company in Japan. . . . **Phil Yang,** II, is at M.I.T. grad school. . . . **Harvey Singer,** II, is at M.I.T. with an N.S.F. fellowship. . . . Mrs. **Chi-Yu Yang Hu** is at St. John's University as a research associate. . . . **Bruce Smith,** VIII, is studying for a Ph.D. in astrophysics at the University of Maryland. He has a three-year NASA fellowship. . . . **Larry Yermack,** XV, is working in the Astro-Electronics Division of R.C.A. . . . **William A. Smith,** XVIII, is at M.I.T., as is **Zvi Zarhy,** XIII. . . . **Jerry Smith,** VIII, has a graduate assistantship at Oklahoma State University. . . . **William Smith,** XV, is working for the Beloit Corporation in Beloit, Wis. . . . **Leroy Snare,** XVI, is working at the U.S. Naval Avionics Facility in Indianapolis, Ind. . . . **Jose Alonso,** VIII, is at M.I.T. on an N.S.F. . . . **Arthur Snider,** XVIII, is an analyst at the M.I.T. Instrumentation lab. . . . **Jeremy Alperin,** XVIII, is in medical school at the University of Vermont. . . . **Norman Soloway,** XV, has a fellowship at the Boston College Law School. . . . **Edgar Alzner,** XVI, has a research assistantship at M.I.T. . . . **Joel Spalter,** XVIII, is in medical school at New York University. . . . **Steve Amador,** XV, is working in the Product Planning Department at Ford Motor Company. . . . **William Drew,** XV, is living in Nashua, N.H., and is the assistant to the vice-president of manufacturing at the Improved Machinery Company. . . . **John Rourke,** VII, is at the University of Michigan Medical School. . . . **Robert H. Walker,** a first lieutenant in the Army, was recently assigned to the U S. Army Biological Labs at Fort Detrick, Md. . . . **Hal Waller,** II, is attending graduate school at Northwestern University. . . . **Ken Wang,** II, is at M.I.T. as a research assistant and **Shen Wang.** XIII, is also at M.I.T. . . . **John Weibel,** XV, is a supervisor of engineering at the Frigidaire Division of GMC in Dayton, Ohio.

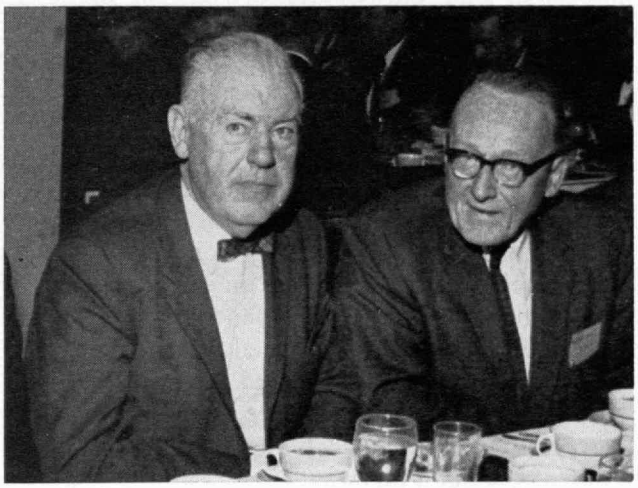
Gerald Spielman, XVIII, is in the Arts and Sciences Department at New York University. . . . **Jim A. Anderson,** VIII, is in grad school at M.I.T. in the Biology Department. . . . **Robert Spivock,** XV, is working as a manufacturing engineer for Lockheed Missiles and Space Company in Sunnyvale, Calif. . . . **John Stanley,** VI-A, is at the Dallas Theological Seminary in Dallas, Texas. . . . **Douglas Steele,** VI-B, is at M.I.T. on a Sloan Fellowship and was married last September. **John Stettler,** VIII, is an assistant professor at the Missouri School of Mines in Rolla, Mo. . . . **Norman Strahm,** VI, is at M.I.T. on an N.S.F. . . . **W. H. Anderson, Jr.,** XI-B, is at the Jefferson Medical College in Philadelphia, Pa. . . . **Robert Armsby,** IV-A, is in the Navy. . . . **Richard Sullivan,** XI, is working for the Connecticut State Department of Health. . . . **Arthur Sutherland,** XVI, is in grad school at M.I.T. . . . **Robert Swaney,** XV, is working in Engineering Administration at McDonnell Aircraft Company. . . . **Mohamed Badrawi,** XVI, is at M.I.T., is married, and has one son. . . . **John Banzhaf,** VI, has a scholarship at the Columbia University School of Law, where he is studying to be a patent lawyer. . . . **Douglas Barritt,** XVI-B, is working for Boeing and is attending grad school part time at the University of Washington. . . . **Richard Bartsch,** VI-2, is in grad school at M.I.T. . . . **Joseph Bajoni,** XVI-B, is working for Douglas Aircraft. . . . **Carl Bauer,** XI, is working as an engineer for Dow Chemical Company. . . . **Elliott Bayly,** VI, is at grad school at Stanford University.—**Gerald L. Katell,** Secretary, 3771 Redwood Circle, Palo Alto, Calif.

Recent Reports from the Cameramen Constantly Roaming the Institute



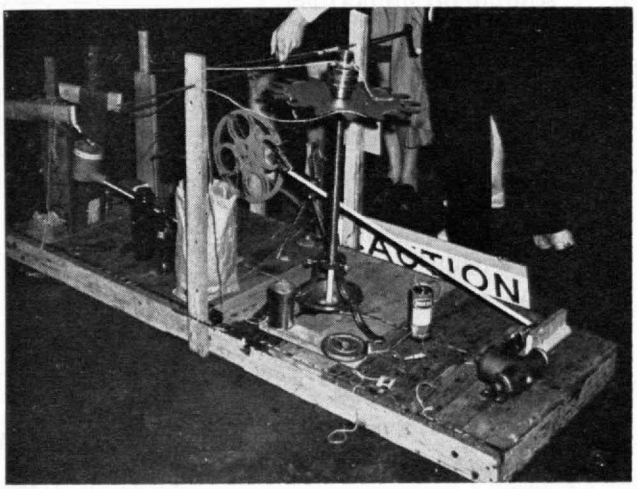
STUDENTS at M.I.T. from 60 other colleges inspected photos by Harold E. Edgerton, '27, during a pause in a conference on "The Federal Government—How Much?"

DAUGHTERS of William H. Richards, '27, Roberta and Jean Richards oversee the nutrition of M.I.T. students and their guests as dieticians in Baker and Burton House.



REGULAR attendants at the monthly Alumni Council dinners, held the last Monday of the month, John W. Kilduff, '18, and Egon E. Kattwinkel, '23, are shown above.

M.I.T. STUDENT members of the Society of American Military Engineers view the Army's self-propelled 105-mm. howitzer on a tour through the Aberdeen Proving Grounds.



SOPHISTICATED, complex, ingenious and inefficient describe Phi Kappa Sigma's walnut-cracking machine which won first prize in an Inter-fraternity Council contest.

WITH mighty determination, Jim Graham, '63, and his date, Cornelia Stephens, riding for Chi Phi, strained valiantly toward the finish line in the tricycle relay event at IFC.

On The Importance Of Your Gift To The Alumni Fund

"How can my small gift be of any importance? If the Alumni Fund wants to raise $1 million, why not find one man with a million or even ten men with $100,000 each? Wouldn't it be easier?"

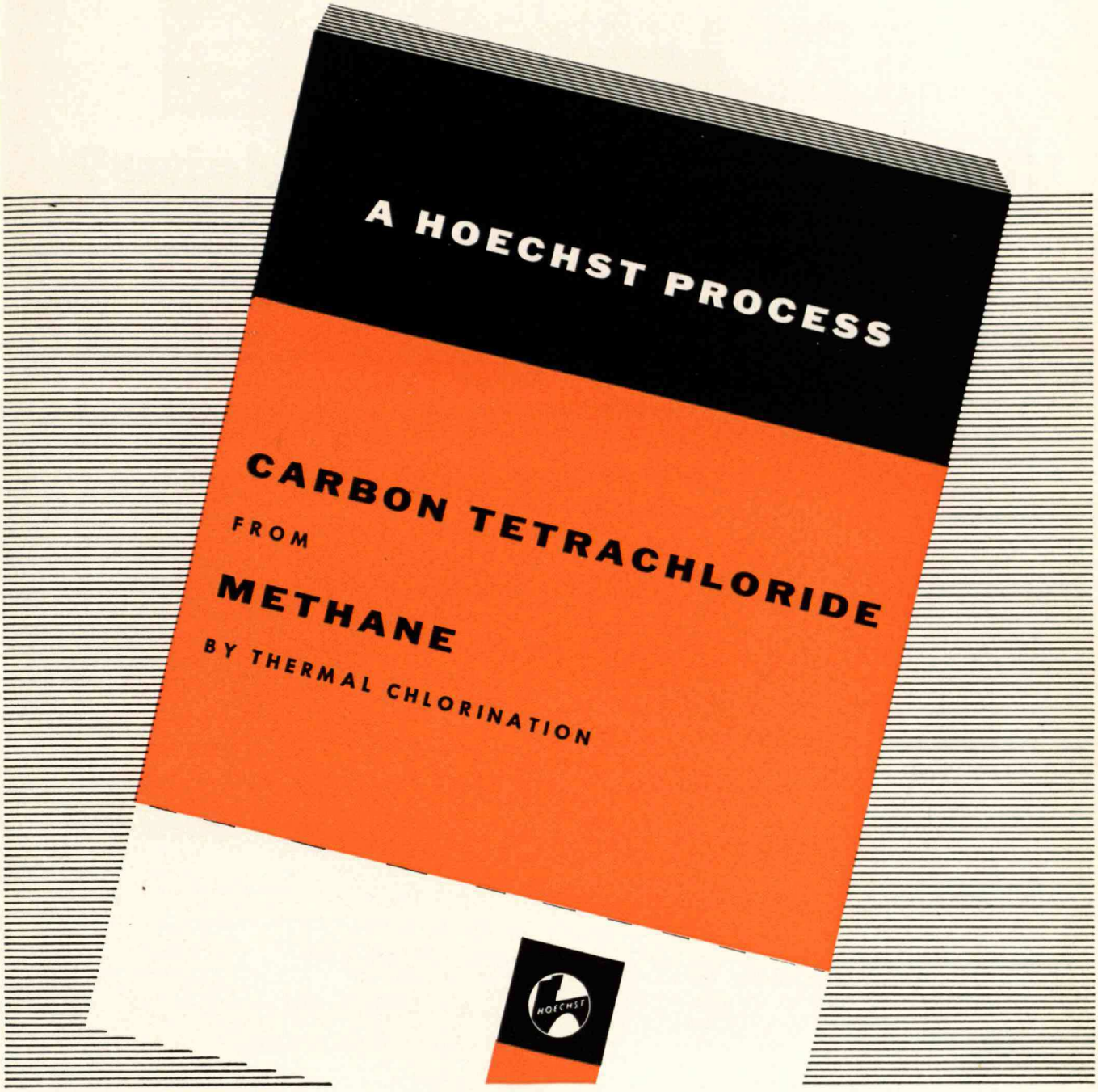
Well, it's perfectly possible. It might, indeed, be easier. But, while the raising of funds is the reason for being of annual giving, it has other and very important objectives.

The strength of any great university lies primarily in its faculty, its facilities, and its alumni. If its alumni body is interested, well-informed, and participates actively in its affairs, the university is the stronger for it.

The alumnus who gives the Institute $1 million is to be highly commended for his thoughtfulness and generosity. But when 20,000 Alumni give that same total, there are more far-reaching effects. By their actions, these men, who as a group know M.I.T. better than any other, have shown their faith in it and their willingness to play an active role in shaping its future. This evidence of confidence does not go unnoticed elsewhere. Foundations, corporations, and non-alumni are impressed by such evidence, and are the more willing to come to its support. An unknown poet put it this way:

> Foundations give to Smithers U
> And also to McWhorter.
> But more to Smithers U because
> Alumni do support her.

So, in the months ahead, when you are asked to contribute to the 1964 Alumni Fund, do keep this in mind. Of course, it is hoped that every alumnus will give thoughtful consideration to the size of his gift, that it will be commensurate with his capability and his other commitments. But be assured that every contribution is important, that it exerts an influence far greater than may appear.



Further information may be obtained from

HOECHST-UHDE CORPORATION

350 Fifth Avenue, New York 1, N. Y.
8204 Empire State Bldg.

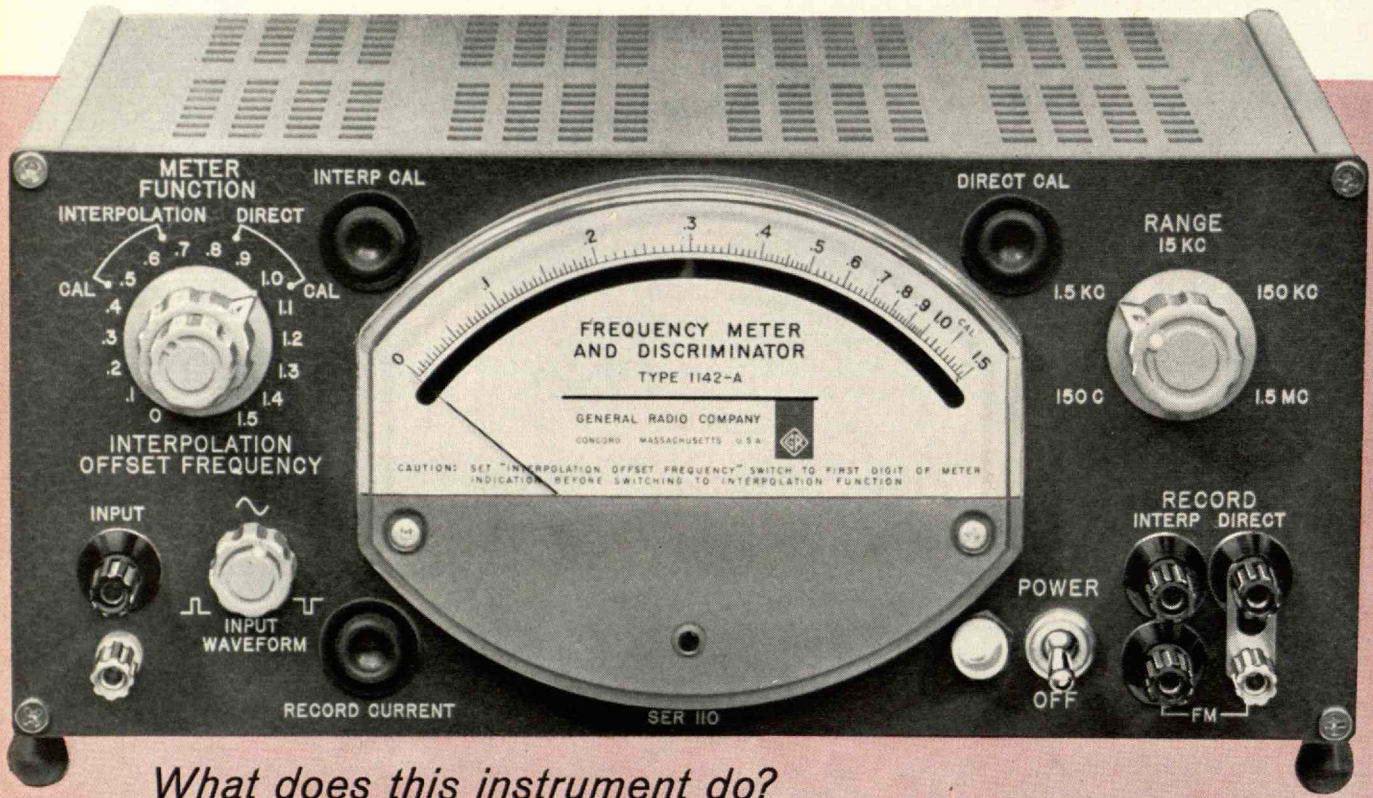
CHEMICAL PROCESSES

PLANT DESIGN

0.2% Accuracy

in an Instrument with a Meter?

Sounds impossible but it's true. Of course there's a little trickery involved . . . but it's honest. We've moved the first one or two digits off the meter and put them on a switch, and thereby let the meter do the fine work — the interpolating. The switch (marked Interpolation Offset Frequency) controls a precise 0.05% voltage divider connected across a highly linear frequency discriminator. The meter (accuracy, 1% of reading) simply reads what's left over. This technique lets you read up to three significant figures without eye strain. Pencil and paper will soon show you that this procedure gives you an accuracy of better than 0.2% of full scale.



What does this instrument do?

The 1142-A Frequency Meter and Discriminator measures frequencies from 3 cycles to 1.5 megacycles. If you choose, you can also measure a 100-Mc signal to 1 part in 10^9 by using heterodyne techniques. This instrument also gives you an analog output proportional to frequency for direct use with graphic recorders (no digital-to-analog converters necessary). As a discriminator, the 1142-A has a linearity that is typically 0.1%. Residual noise level is down more than 100 db. Sensitivity is 20 mv between 20c and 150 kc, rising to 200 mv at 3c and 1.5 Mc.

The Price is $525 (in U.S.A.), several hundred dollars less than the lowest price 1-Mc digital frequency counter.

GENERAL RADIO COMPANY

WEST CONCORD, MASSACHUSETTS

In EUROPE
General Radio Overseas
Zurich, Switzerland

NEW YORK, N. Y., 964-2722 Ridgefield, N. J., 943-3140 | CHICAGO (Oak Park) 848-9400 | PHILADELPHIA, 424-7419 Abington, 887-8486 | WASHINGTON, D.C. (Rockville, Md.) 946-1600 | SYRACUSE 454-9323 | DALLAS FL 7-4031 | SAN FRANCISCO (Los Altos) 948-8233 | LOS ANGELES 469-6201 | ORLANDO, FLA. 425-4671 | IN CANADA (Toronto) 247-2171